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Adaptive Capacity as antecedent to Climate Change Strategy

A Systematic Literature Review

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Foreword

Due to the emergence of shortages concerning natural resources and the globalization of production, sustainability has become vital in business decisions. Meanwhile, sustainability management has become an independent field of research in business science and in the decision processes of companies. The research and teaching of the Chair of Environmental Management and Accounting of the Technische Universität Dresden focus on the economic and environmental efficiency (e³) in organizations. Strategies for practical use are developed based on scientific concepts. In recent years the importance of the natural environment in the economic sciences has been increasing continuously.

The research program of the Chair of Environmental Management and Accounting at the Technische Universität Dresden is reflected in the composition of the teachings. In this way the knowledge gained from the theoretical and practical research flows directly into each of the lectures. The current scientific series “Dresdner Beiträge zur Lehre der Betrieblichen Umweltökonomie” aims to support this integration process. Contents of the scientific series are predominantly theses selected from the Chair of Environmental Management and Accounting through which the reader may gain an insight into the key activities of the chair as well as a clear understanding of the work content.

The scientific series was composed by Dr. Susann Silbermann and the coordination of the present series was carried out by Kristin Stechemesser.

Within the last decade research on climate change strategies and adaptive capacity emerged as the debate about climate change was intensified with the publishing of the Third Assessment Report by the Intergovernmental Panel on Climate Change in 2001. That companies are facing risks and opportunities is not new and the awareness to address these issues is growing. However, there is still need for research in the field of corporate strategic response to climate change. Recently, research focused on resilience management to address climate change. Resilience management is about being able to experience changes and remain stable getting back into the same situation before the change happen. On the contrary to resilience management adaptive capacity is about the ability to be able to adapt to uncertain and unexpected events on the long term. This includes long-term changes. This work argues that companies should think about their adaptive capacity as climate change induces short and long-term changes. Adding this dimension to the strategic planning companies need to think of how they can improve their adaptive capacity.

This work investigates research in both issues adaptive capacity and climate change research and in their relation. Applying a systematic literature review this study conducted 60 references which are examined by a qualitative-quantitative analysis and answers the following questions: What is the current scientific view of adaptive capacity within strategic management literature? What are determinants of adaptive capacity? How can adaptive capacity be linked to climate change strategy and is it even antecedent to climate change strategies? The findings of this research indicate that adaptive capacity and climate change strategies exhibit a link but it cannot be proved whether adaptive capacity is antecedent. Furthermore, the term adaptive capacity is merely discussed within strategic management literature and if it is discussed and examined, several concepts and theories are applied to explain determinants of

adaptive capacity. Several concepts such as dynamic capabilities, organizational learning capability, organizational learning, organizational change capacity, flexibility and more could be identified as concepts enhancing adaptive capacity. This work provides an overview of related concepts and theories.

Edeltraud Günther

The scientific foundation of the work is based upon the results of the diploma thesis by Julia Hillmann which was written at the TU Dresden, Chair of Environmental Management and Accounting. Professor/Lecturer: Prof. Dr. Edeltraud Günther / Supervisor: Dipl.-Kffr. Kristin Stechemesser. The author is solely responsible for the content of this scientific work.

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List of Abbreviations

AC	Adaptive capacity
CAS	Complex adaptive systems
CCS	Climate change strategy
DC	Dynamic capability
etc.	Et cetera
HRM	Human Resource Management
EWE	Extreme weather event
GHG	Greenhouse gas emissions
i.a.	Inter alia
i.e.	Id est
IPCC	Intergovernmental Panel on Climate Change
OCC	Organisational change capacity
OL	Organisational learning
OLC	Organisational learning capability
n.A.	Not available
UNEP	United Nations Environment Programme
RBV	Resource-based view
SES	Social-ecological systems

1 Introduction

*“Some men see things as they are and ask why.
Others dream things that never were and ask why not.”*

Georg Bernard Shaw

This thesis investigates the link between adaptive capacity and climate change strategy of a company and whether adaptive capacity can be seen as special case of climate change strategy thus as an antecedent to it, a question that still remains open.

This clearly points at the debate about the necessity for companies to integrate modern aspects of climate change into their business activities. Within the last two decades it has been discussed how urgent human-induced climate change is and what the impact for society are.¹ This was pushed by the third Assessment Report of the Intergovernmental Panel on Climate Change in 2001 by stressing the fact that temperature will rise and cause climatic impacts such as rise of sea-level, extreme weather events and so forth.² The well-known STERN report to which scientists and also practitioners often refer highlights the effects of climate change and their implication for the world. As STERN states “the overall costs and risks of climate change will be equivalent to losing at least 5 percent of global GDP each year” if nothing will be done against climate change.³ Obviously, this has also important implications for the business world.

Climate change is regarded as one global trend for the future which has to be dealt with.⁴ In 2006, however, the TÄLLBERG FOUNDATION pointed out that the pace of acceptance within business community is slow.⁵ But four years later PRICEWATERHOUSECOOPERS reported that the 500 leading companies (Global 500) are responding to climate change more actively.⁶ This means that the necessity to address climate change issues is growing within business practice. The fact, that climate change has different impacts through physical risks i.e., weather-related risks and regulatory risks i.e., new regulations for carbon emissions and pricing, indirect effects on value chain and higher uncertainty on the business world are already discussed.⁷ On the contrary, companies also experience opportunities in developing new technologies, new products, enhancing their reputation and gaining competitive advantage.⁸ As HOFFMAN & WOODY emphasize there is a need to think of climate change as a market issue instead of an environmental issue.⁹ “Does it pay to be green? While this is an often-asked question, it is in fact nonsensical, like asking „Does it pay to innovate?“ the authors argue within their Book: Climate Change – What’s your business strategy.¹⁰ Taking this into ac-

¹ See WORLD BUSINESS COUNCIL FOR SUSTAINABLE DEVELOPMENT (eds.) (2011), w/o page.

² INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (eds.) (2001), w/o page.

³ STERN, N. (2006), p. 239.

⁴ See FEDERAL MINISTRY FOR THE ENVIRONMENT, NATURE CONSERVATION AND NUCLEAR SAFETY (eds.) (2008), p. 7.

⁵ See TÄLLBERG FOUNDATION (eds.) (2006), p. 23.

⁶ See PRICEWATERHOUSECOOPERS (eds.) (2010), p. 7.

⁷ For example see HOFFMAN, A. J.; WOODY, J. G. (2008), pp. 5-13., ROBBINS, P. T. (2001), p. 2ff. and 231ff., DUNN, S. (2008), pp. 28-29, JESWANI, H. K.; WEHRMEYER, W.; MULUGETTA, Y. (2008), pp. 46-47.

⁸ NITKIN, D.; FOSTER, R.; MEDALYE, J. (2009a), p. 19

⁹ See HOFFMAN, A. J.; WOODY, J. G. (2008), p. 5f.

¹⁰ HOFFMAN, A. J.; WOODY, J. G. (2008), p. 19.

count it becomes clear that climate change has influence on a wide range of business activities. However, the question remains what actions and strategies companies apply to address climate change. Even though there is a growing awareness within business community there is still need for research in the field of corporate strategic response to climate change. In-depth research on corporate response to climate change was done by HOFFMAN and the PEW CENTRE ON GLOBAL CLIMATE CHANGE. GÜNTHER suggested a resilience management framework to address climate change i.e., how companies resist against negative external impact of climate change and how it adapts in short-term to return to its starting point. In short, resilience is about achieving and sustaining 'fit' to external conditions. In strategic management this approach is discussed to be not sufficient as climate change implies short and long-term effects inducing uncertainty and therefore the need of the ability to change and continuously adapt.

Therefore, the concept of adaptive capacity is considered. Intuitively, adaptive capacity means the ability to adapt which gives raise to the assumption that adaptive capacity might be an antecedent to adaptation actions, in particular (climate change) strategies. Adaptive capacity, introduced in the 1980s, is a research term that is spread over many research disciplines ranging from natural science including disaster and climate change research to organisational theory. Hence the topic "adaptive capacity as antecedent to CCS" is a complex subject that covers many research fields and their theories. Approaching this topic is therefore challenging as knowledge and background of several research areas have to be provided to cover the topic of this work.

This work originated from the regional project on climate change adaptation REGKLAM ("Development and Testing of an Integrated Regional Climate Change Adaptation Programme for the region of Dresden"). More precisely it is part of a subproject focussing on climate change adaptation and innovation strategies and is executed by the Chair of Environmental Economics and Accounting at the Technical University of Dresden. The research field of integrating environmental issues into business and management has cross-disciplinary character which can be seen within this thesis.

Adaptive capacity is a concept which is especially discussed on a national and policy level. This may be a result of climate change adaptation research which focuses on climate change, its impact on national, community and individual level and adaptation solutions. However, this work focuses on adaptive capacity in business.

The applied method within this thesis is a systematic review of scientific literature within the field of adaptive capacity and climate change strategy is emerging and there is a need to establish current scientific view on adaptive capacity and climate change strategies. Searching online for the term "Adaptive Capacity as an antecedent of Climate Change Strategy" in Google™ result in over 9.900 outcomes result.¹¹ A few months earlier it has only been over 8000 results. This is an increase of almost 25%.

This thesis is divided into a theoretical and a methodological part, followed by a concluding section presenting results and an overall discussion as shown in Figure 1.

¹¹ GOOGLE™ Scholar Beta, <http://scholar.google.com/> © 2011, requested: 6/17/2011, 9.34 am.

I start by examining the theoretical background of adaptive capacity and strategy formulation with regard to climate change and the rationale for the underlying research questions. **Chapter 2** provides the theoretical overview and definition of ‘adaptive capacity’ and ‘climate change strategy’. Within chapter 2.1 the theory of adaptive capacity is approached by analysing different contexts that are relevant for this thesis. This is followed by a definition of strategy and strategy formulation from strategic management literature and the current scientific view on strategy and climate change within chapter 2.2. Resulting from that the research questions are derived and it is discussed how both topics are related to each other:

Research Question 1:

*Is adaptive capacity a concept which made its way into the strategic management literature?
What is said about adaptive capacity?*

Research Question 2:

What determines adaptive capacity?

Research Question 3:

*Can adaptive capacity in fact be linked to strategy formulation
and to a climate change strategy?*

Research Question 4:

Is adaptive capacity antecedent to climate change strategy?

In **Chapter 3** I proceed with developing a methodological framework and its implementation. Within this work a systematic literature review is applied which theoretical basis and application is also explained within this chapter. Limiting the search results leads to 60 relevant references. By applying a deductive-explorative qualitative analysis¹² a coding sheet is derived based on the research questions to analyse these 60 conducted most relevant references. Furthermore, the coding sheet is the basis for the subsequent synthesis of references.

Then, I analyse the conducted references within **Chapter 4** and explain the approach for synthesising the references with regard to the main research questions. The references are hereby analysed in different ways and it is explained which way was assessed to develop the most suitable findings. These findings are completed with a reflection of findings on research questions, critics and limitations to this findings and pointing at future research needs.

Chapter 5 closes with an overall conclusion of this work.

¹² See MAYRING, P. (2002).

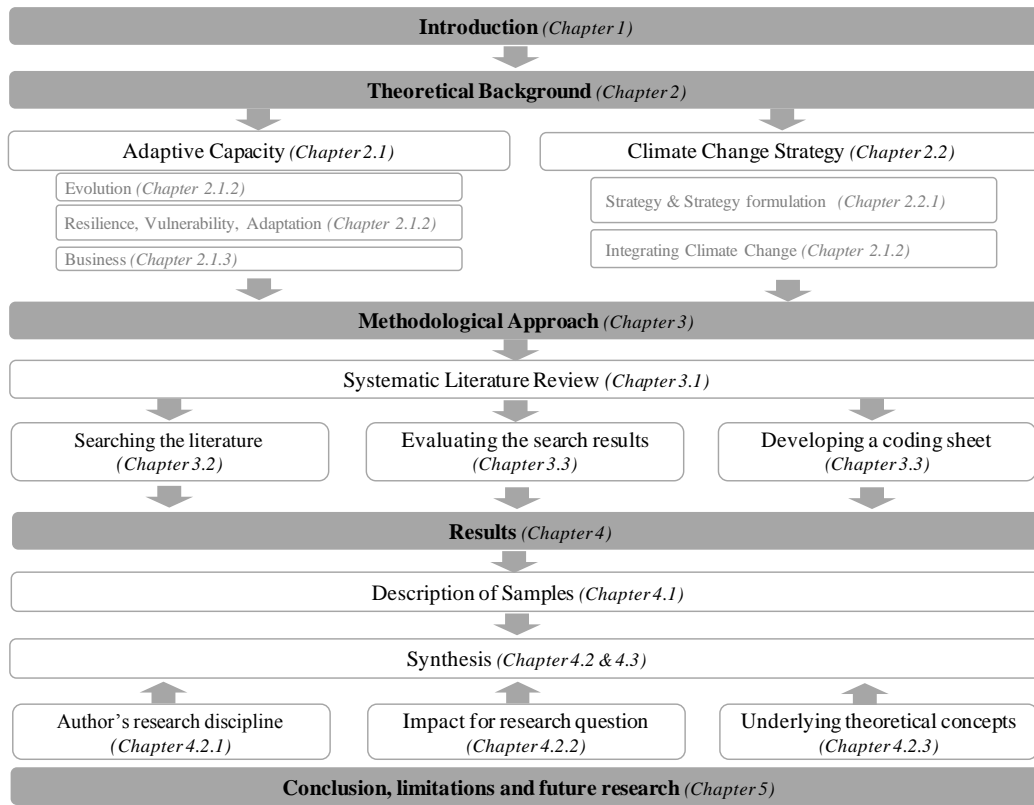


Figure 1: Content and structure of this work
(Own illustration.)

2 Theoretical Background

“He who loves practice without theory is like the sailor who boards ship without a rudder and compass and never knows where he may cast.”

Leonardo da Vinci

In this chapter I define the relevant terms adaptive capacity, strategy – respectively climate change strategy and strategy formulation. Underlying key questions for this chapter are:

- (1) What is the common scientific view on adaptive capacity and how is it defined?
- (2) What are factors of adaptive capacity?
- (3) Does the term Adaptive Capacity exist in the business context?

2.1 Adaptive Capacity in different research contexts

When studying adaptive capacity intensively, one discovers fast that it is a broad and complex topic which is being discussed in different research fields. There are multiple definitions of the term adaptive capacity which have its roots in various research fields such as climate change adaptation research, resilience research, disaster research, ecology, economic geography, risk research, (social) policy and also organisational studies.¹³ One can say that “adaptive capacity has worked its way as organizing concept into research of those who contemplate the potential harm that might be attributed to global climate change or other external stresses”.¹⁴ To get an impression of the variety of adaptive capacity see the Table 15 in Appendix A. 1. Establishing a holistic understanding of adaptive capacity requires a closer look at the background and origin of the term. Within this chapter I present that there are as many different definitions of adaptive capacity as there are research fields studying the concept. Hereby, I concentrate on examining the concept adaptive capacity in the context of evolution, resilience and vulnerability and business.

I start with the origin of adaptive capacity within the evolutionary context and briefly give an overview to the concept of HOLLING and GUNDERSON (Chapter 2.1.1). Then I examine the term within the research of the concepts of resilience and vulnerability (Chapter 2.1.2). I remark, that the research of these concepts and the research disciplines, in general, are not strict distinct as some resilience researchers are also settled within disaster research or other ties between research of concepts and research disciplines are possible. I do not claim a clear distinction since this is not the focus of this work and is not required for the understanding of adaptive capacity.¹⁵ I rather focus on the concepts of resilience and vulnerability for examining the term adaptive capacity and do not go into detail about the different research fields. Finally, I aim at discussing the development and meaning of adaptive capacity within the business context (Chapter 2.1.3).

¹³ See GÜNTHER, E. (2009), pp. 117-151 and GAILLARD, J. C. (2010), pp. 218-220.

¹⁴ YOHE, G.; TOL, R. S. J. (2002), p. 26.

¹⁵ For a deeper understanding see the references to relevant authors within chapter 2.1.2.

2.1.1 Adaptive Capacity in the context of evolution

The observation of systems and their development (process of adaptation and possibility to do so) over time has been studied for more than 200 years and was strengthened after DARWIN published his work about the theory of evolution. Adaptability in its evolutionary context means the ability to become adapted to environmental contingencies to be able to live.¹⁶

Within the evolutionary context the theory of HOLLING & GUNDERSON gained importance in the 1970s. Knowing that theory is important since it influenced the development of resilience, vulnerability and adaptation research. HOLLING & GUNDERSON describe that ecosystems are defined by several sequences of states in an adaptive cycle.¹⁷ These cycles are determined by potential and connectedness. Connectedness is a degree of the rigidity or flexibility of a system while potential is the capacity of a system to change. The factor resilience was integrated later on and is closely interrelated to the factors connectedness and potential. GÜNTHER summarizes that the lower the potential and connectedness of a system, the higher is the resilience.¹⁸ The findings of GUNDERSON & HOLLING were the basis for the transference from the ecological context to the socio-ecological context. The process of adaptation of socio-ecological systems (in the following abbreviated with SES) to environmental changes can be explained by the 2 findings according to WINN & KIRCHGEORG:

- SES systems are capable to adapt their behaviour by realizing and anticipating environmental states. Hence, humans may influence their own process of adaptation through communication and technological developments.¹⁹
- SES experience four several sequences of states within their adaptation process, which are closely connected to each other: growth, steady-state, change and reorganization.²⁰

The term adaptive capacity itself is not explicitly used within the evolutionary context. In the broader sense, the capacity or potential of a system to change, causing systems to adapt can be interpreted as adaptive capacity.

2.1.2 Adaptive Capacity in the context of Resilience, Vulnerability and Adaptation

Starting in the early 1970s the concepts of resilience, vulnerability and adaptation emerged in different research fields.²¹ To understand adaptive capacity one will have to understand the concepts of resilience and vulnerability as well. These concepts are closely related and it is a challenge to compare these concepts or even define a clear distinction between them.²² Therefore, I give a brief introduction to the resilience and vulnerability concepts, before I define the term adaptive capacity.

¹⁶ See GALLOPIN, G. C. (2006), p. 300.

¹⁷ See HOLLING, C. S.; GUNDERSON, L. H. (2002), p. 41 cited in GÜNTHER, E. (2009), p. 120.

¹⁸ See GÜNTHER, E. (2009), p. 120.

¹⁹ See WINN, M. I.; KIRCHGEORG, M. (2005), p. 260 cited in GÜNTHER, E. (2009), p. 121.

²⁰ See WINN, M. I.; KIRCHGEORG, M. (2005), p. 260 cited in GÜNTHER, E. (2009), p. 121.

²¹ See GAILLARD, J. C. (2010), p. 220. See also GÜNTHER, E. (2009), p. 117ff.

²² See dissertation of GÜNTHER, E. (2009) who compares and combines the three concepts from a resilience perspective.

Resilience

The resilience concept derives from the research of ecological systems and emerged in the 1970s within the research of socio-ecological systems.²³

Subject of study within the resilience research is a system and how systems cope with changing environments. As we already discussed at the beginning there is no common scientific definition of the resilience concept.²⁴ HOLLING, who was the first to define the term, stated that resilience is a capacity of a system to experience disturbance and still maintain its ongoing functions and controls.²⁵ TIMMERMANN provides a definition from a socio-ecological background: “resilience is the ability of human communities to withstand external shocks or perturbations to their infrastructure, such as environmental variability or social, economic, or political upheaval, and to recover from such perturbations.”²⁶ As GÜNTHER sums up, all definitions have in common that resilience describes the tolerance of a system within it still remains stable - so to speak - resilience basically describes the robustness of a system.²⁷

One may ask which role adaptive capacity plays within the resilience research. *Adaptive capacity* is seen as a factor which *fosters the capability to learn and adapt* and this determines the resilience of a system.²⁸ This implies that the resilience of a system is dependent on its adaptive capacity.

Vulnerability

The vulnerability concept emerged in the late 1970s. Over time, it gained more importance in particular within the context of climate change. As GAILLARD states it played a pivotal role within national and international policy documents like the Brundtland Report 1987.²⁹ The vulnerability concept is often discussed on a national level and in context of community development.³⁰ In the broad sense, scholars³¹ of vulnerability investigate in vulnerability of systems and factors which drive vulnerability of systems. More precisely, the vulnerability research examines exposure and sensitivity of systems.³²

Exposure is described as the degree to which a system is confronted with climatic changes. This includes magnitude, frequency, duration and areal extent of the climatic stimuli.³³

²³ See GÜNTHER, E. (2009), p. 117 and GAILLARD, J. C. (2010), p. 220.

²⁴ See GÜNTHER, E. (2009), p. 131. The different definitions derive from the different research backgrounds. At the beginning of the chapter it was pointed out that adaptive capacity can be found within various research fields. As these three concepts are closely related the same problem applies for resilience. See also GAILLARD, J. C. (2010), p. 220. For a holistic understanding of resilience see the dissertation of GÜNTHER, E. (2009).

²⁵ HOLLING, C. S. (1973), p. 17.

²⁶ TIMMERMANN, P. (1981), w/o page. For other definitions see ADGER, W. N. (2000), CUMMING, G. S. et al. (2005) and WALKER, B. H. (2004) as cited in GÜNTHER, E. (2009).

²⁷ See GÜNTHER, E. (2009), p. 132. For detailed information on the different resilience scholars see GÜNTHER, E. (2009), pp. 125-133.

²⁸ See GÜNTHER, E. (2009), p. 145.

²⁹ See GAILLARD, J. C. (2010), p. 223.

³⁰ To cite just a few see ARMITAGE, D. (2005), YOHE, G. W.; TOL, R. S. J. (2002), SMIT, B.; WANDEL (2006) and GAILLARD, J. C. (2010).

³¹ Scholars are authors researching one concept in particular. This means that there are resilience scholars and vulnerability scholars but still these scholars do have different research backgrounds e.g. disaster research, climate change research, ecology and so forth.

³² GALLOPIN, G. C. (2006), p. 294 cited in GÜNTHER, E. (2009), p. 137. As GALLOPIN states, these aspects are basically inherent in all research fields. See as well SMIT, B.; WANDEL, J. (2006), p. 286.

³³ BURTON, I.; KATES, R. W.; WHITE, G. F. (1993), p. 224 as cited in GÜNTHER, E. (2009), p. 142.

Sensitivity is according to ADGER defined as the degree to which a system is modified or affected by perturbations.³⁴ Whereas GALLOPIN sees sensitivity as the “extent to which a system can absorb impacts without suffering long-term harm or other significant state changes”.^{35,36}

SMIT & WANDEL define *vulnerability* as “a function of exposure and sensitivity of a system to hazardous conditions and the *ability or capacity* or resilience of the system *to cope, adapt* or recover from the effects of those conditions”.³⁷ KLEIN & NICHOLLS state that vulnerability (of socio-ecological systems) is “determined by the impact potential and society’s technical, institutional, economic and cultural *ability to prevent or cope with these impacts, i.e. its capacity to adapt* within the timescale of natural changes”.³⁸ GÜNTHER compares several definitions within his work and points out that the difference in definitions depends on the point of view whether vulnerability is either seen as:³⁹

- a) an occurring risk to systems or
- b) as a predisposition to systems or
- c) as a resulting state of a system after change.

How is adaptive capacity integrated into vulnerability research? As highlighted in the above given definitions adaptive capacity is a factor of the vulnerability of a system. YOHE & TOL provide a more precise correlation and state that adaptive capacity is a determinant of sensitivity. While sensitivity is an attribute of a system prior to change, adaptive capacity is a changing component.⁴⁰ KLEIN/NICHOLLS/THOMALLA state that adaptive capacity was introduced to reflect the awareness that reducing vulnerability requires having mechanisms in place such as technologies, expertise or other resources available.⁴¹

Adaptive capacity

Thus far, we know that *Resilience* aims at explaining how systems cope with change and how these systems behave if thrown out of its steady-state and the degree to which a system recovers, while *Vulnerability* examines the connection / interrelation of exposure and sensitivity of systems to change. At the end of every part I pointed out how adaptive capacity (in the following abbreviated with AC) is related to these two concepts. Until now, it should be clear that AC is a component of the definitions of resilience and vulnerability. De facto, it is being discussed whether adaptive capacity is a concept itself or not. Within this work AC is seen as a separate concept. I hereby refer to GÜNTHER and GAILLARD. As GAILLARD reviews, AC was first considered as a separate concept in the late 1980s.⁴² This importance was strengthened in the last years with the report by the International Panel on Climate Change.⁴³ One might wonder how adaptive capacity is related to climate change.

³⁴ ADGER, W. N. (2006), p. 270.

³⁵ GALLOPIN, G. C. (2006), p. 2.

³⁶ This definition reminds of the resilience definition. Here should be noted, that the assignment of sensitivity to resilience is insufficient. For detailed argument on this topic see GÜNTHER, E. (2009), pp. 117-196.

³⁷ SMIT, B.; WANDEL, J. (2006), p. 286. See also YOHE, G. W.; TOL, R. S. J. (2002), p. 27.

³⁸ KLEIN, R. J. T.; NICHOLLS, R. J. (1999), p. 185.

³⁹ See GÜNTHER, E. (2009), pp. 138-141.

⁴⁰ See YOHE, G. W.; TOL, R. S. J. (2002), p. 27.

⁴¹ See KLEIN, R.J.T.; NICHOLLS, R. J.; THOMALLA, F. (2001), p. 38.

⁴² GAILLARD, J. C. (2010), p. 220.

⁴³ GAILLARD, J. C. (2010), p. 219. See as well ARMITAGE, D. (2005), p. 703.

For further understanding it is important to point out that adaptive capacity is a substantial part of climate change adaptation research. Hitherto I did not stress the importance of the different research fields. I mentioned the complexity of and the existing links between concepts and research fields. Within this research field the concept of AC gained more importance. Adaptation research analyses which capabilities systems have and what actions systems can apply for adapting successfully to change. As reported by SMIT & WANDEL adaptation is the manifestation of adaptive capacity.⁴⁴ This means that adaptation is determined by a systems AC.

In accordance to the already illustrated complexity of its origin it is not surprisingly, that AC lacks of a consistent definition as well. SMIT ET AL. mention that AC is correlated to or used interchangeably with various other concepts, including adaptability, coping ability, management capacity, stability, robustness, flexibility, and even resilience.⁴⁵ In the following table I give an overview of definitions provided by different scholars and authors:⁴⁶

Table 1: Definitions of adaptive capacity

Scholars	Author	Year	Definition
Resilience	WALKER	2004	Adaptive capacity is as “an aspect of resilience that reflects learning, flexibility to experiment and adopt novel solutions, and development of generalized responses to broad classes of challenges.” ⁴⁷
Vulnerability	ADGER	2006	“ability of a system to evolve in order to accommodate [...] change and to expand the range of variability with which it can cope”. ⁴⁸
Vulnerability	MCCARTHY ET AL. (IPCC)	2001	“The ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences.” ⁴⁹
Vulnerability	SMIT & WANDEL	2006	Adaptive capacity can be defined via thresholds and ‘coping ranges’ by “the conditions that a system can deal with, accommodate, adapt to, and recover from.” ⁵⁰
Vulnerability	KLEIN ET AL.	2003	Adaptive capacity is “the ability to plan, prepare for, facilitate, and implement adaptation options.” ⁵¹
Vulnerability	TOMPKINS & ADGER	2004	Adaptive capacity is a “set of preconditions that enables individuals or groups to respond to climate change.” ⁵²
Social Vulnerability	DAVIS ET AL.	2004	(Adaptive) Capacity “refers to the resources and assets people possess to resist , cope with and recover from disaster shocks they experience” ⁵³

⁴⁴ SMIT, B.; WANDEL, J. (2006), p. 284.

⁴⁵ See SMIT, B. et al. (2001), p. 294.

⁴⁶ These authors are cited by other authors who contemplate vulnerability or resilience of ecological systems or SES (individuals, communities, regions, etc.). See therefore as well GÜNTHER, E. (2009).

⁴⁷ See WALKER, B. H. et al. (2004), w/o page.

⁴⁸ ADGER, W. N. (2006), p. 270.

⁴⁹ MCCARTHY, J. J. et al. (2001), p. 982.

⁵⁰ SMIT, B.; WANDEL, J. (2006), p. 287.

⁵¹ KLEIN, R.J.T.; NICHOLLS, R. J.; THOMALLA, F. (2003), p. 38.

⁵² TOMPKINS, E. L.; ADGER, W. N. (2004), w/o page.

⁵³ See DAVIS, I.; HAGHEBART, B.; PEPPIATT, D. (2004), p. 3.

Scholars	Author	Year	Definition
Adaptive Capacity	ARMITAGE	2005	Adaptive capacity “reflects learning as ability to experiment and foster innovative solutions in complex social and ecological circumstances.”

(According to: GÜNTHER, E. (2009), p. 145f.)

As SMIT & WANDEL state adaptive capacity varies within systems.⁵⁴ This means that AC is related to the system and more precisely it is basically inherent to a system. As shown in Table 2 and Table 12 the endogenous character of AC is almost all definitions in common. Considering these definitions AC is the potential to cope with and adapt to change.⁵⁵ Furthermore it includes resources, capabilities as prerequisites of a system.

Table 2: Overview of explicitly inherent components of adaptive capacity

Author	Explicit components of definition						
	Driver to enhance resilience	Driver to reduce vulnerability	Capability of flexibility	Capability to adapt and recover	Capability to learn	Capability to use opportunities / innovation	Endogenous character
WALKER	+	-	+	+	+	+	-
ADGER	-	-	+	+	-	-	+
MCCARTHY et al.	-	-	-	+	-	+	+
SMIT & WANDEL	-	-	-	+	-	-	+
KLEIN et al.	-	-	-	+	-	-	+
TOMPKINS & ADGER	-	-	-	+	-	-	+
DAVIS et al.	-	-	-	+	-	-	+
ARMITAGE	-	-	-	+	+	+	+

+ component is included within definition - component is not included

(According to: GÜNTHER, E. (2009), p. 147.)

The most interesting insight on AC is given by WALKER and ARMITAGE who states that AC is more than just the capability to adapt. AC includes further the capability to learn and generate new opportunities or foster innovation for adapting to environmental changes. Taking this into consideration, AC can be defined as a characteristic of a SES which can be influenced even though it is inherent to a system. This fact should be kept in mind as it might be of interest for the business context where the necessity for building AC is discussed. To build AC one requires knowing factors influencing the AC of a system. Surprisingly, there is a common sense on which factors determine adaptive capacity.⁵⁶ YOHE & TOL and SMIT et al. give a detailed overview presented in Table 3:

⁵⁴ See SMIT, B.; WANDEL, J. (2006), p. 286.

⁵⁵ See GÜNTHER, E. (2009), p. 146.

⁵⁶ See SMIT, B. et al. (2001), p. 895.

Table 3: Determinant factors of adaptive capacity

	SMIT et al. (2001) ⁵⁷	YOHE & TOL (2002) ⁵⁸
Economic factors	<ul style="list-style-type: none"> • assets • resources • capital resources 	<ul style="list-style-type: none"> • assets • resources
Technological factors	<ul style="list-style-type: none"> • ability to assess • access to new technologies 	<ul style="list-style-type: none"> • available technological options
Institutional factors	<ul style="list-style-type: none"> • infrastructure (access to resources) • nature of institutions (organization and support of institution) 	<ul style="list-style-type: none"> • distribution of resources • access to risk spreading processes • structure of critical institutions (the derivative allocation of decision-making authority)
Information and skills	<p>possession of:</p> <ul style="list-style-type: none"> • recognition of necessity to adapt • knowledge about options • capability to assess options 	<ul style="list-style-type: none"> • ability of decision-makers to manage information, the processes by which these decision-makers determine which information is credible, and the credibility of the decision-makers, themselves • public's perceived attribution of the source of stress and the significance of exposure to its local manifestations
Equity	<ul style="list-style-type: none"> • social capital • commitment to equity (allocation of and access to resources) 	<ul style="list-style-type: none"> • stock of human capital including education and personal security • stock of social capital including the definition of property rights

(Own illustration.)

AC is determined by several factors which can be classified in economical, technological, institutional factors, equity and Information and skills. These factors are interdependent and not necessarily exclusive. This implies that AC is determined by factors which can be easily influenced and factors which are given. Furthermore it means that SES can be actively influenced. Moreover, it can be said that this set of capabilities and resources requires the right way of handling them. KLEIN ET AL. point out that having adaptive capacity does not necessarily imply to successfully adapt to changes in environment.⁵⁹

2.1.3 Adaptive Capacity in the business context

In the last chapter I discussed adaptive capacity within the context of the concepts vulnerability and resilience and defined AC as a separate concept. Furthermore I presented factors which determine AC. As the definition and factors of AC are discussed within SES one may also expect the concept in the business context. This seems to be natural since organisations can be considered as small SES. However, until now, we did not consider any study dealing with AC of companies. For that reason, I now aim at identifying the concept of AC or similar concepts originated in the business context.

In the early 1980s TOFFLER stressed the importance of companies to become more adaptive. Within his book he states that corporations need to become more flexible. He states that companies need to change their organisational structure into more flexible frameworks and mod-

⁵⁷ SMIT, B. et al. (2001), pp. 895-897.

⁵⁸ YOHE, G.; TOL, R. S. J. (2002), p. 26.

⁵⁹ See KLEIN, R.J.T.; NICHOLLS, R. J.; THOMALLA, F. (2003), p. 38.

ules away from a strong hierarchical structure to become more adaptive.^{60,61} (*leader issue*) Even though he did not use the term adaptive capacity he uses the term the adaptive corporation.

More important insights on a term which describes a company's ability to be adaptive is given by CHAKRAVARTY. He investigated research in the early 1980s about organisational adaptation with regard to organizational structure and strategic management. CHAKRAVARTY used the term *adaptive ability* and defines the adaptive ability as the capability of companies to command possessed resources.⁶² A company experiences different states of adaptation which includes the unstable, stable and neutral state. Hereby, adaptive ability is precedent to the state of adaptation which means that adaptive ability determines which process of adaptation is possible and hence which state of adaptation will be sought.⁶³

Adaptive ability is determined by several factors. CHAKRAVARTY defines Organisation Capacity and Material Capacity as determinants of adaptive ability.⁶⁴ Those two determinants can be described by resources a company possesses.

Organisation Capacity⁶⁵

Organisational capacity is the ability to process information which depends on human resources a company obtains. However, the ability to process information is dependent on the organisational arrangement. Organisational arrangement is described by three types such as mechanistic, bureaucratic and organic arrangement. A mechanistic arrangement is top management centred which means that all decisions are made by the top management. Furthermore, the flow of information from the top management to the lower level or otherwise is restricted. As a result the access to external signals is limited and thus the organisation reaction to the environment is restricted. The organic arrangement, on the contrary, ensures a high organisational capacity since an organic arrangement allows the information flow in both directions (from top management to lower levels and vice versa).

Material Capacity⁶⁶

Material capacity is defined as the extent of material resources (input materials, financial resources and technological resources) available within the particular industry and the exploitation of these resources. The exploitation of resources is related to the latitude available to managers. What does latitude mean in this case? Latitude describes ability of managers to assess these resources correctly. A manager who is only short term oriented will not pay attention to resources which require a long time for exploitation. This material capacity influences the strategy a company can pursue.

⁶⁰ See TOFFLER, A. (1985), p. 93f.

⁶¹ This assumption can be assigned to the contingency theory. The contingency theory is discussed within organisational management literature. This theory examines determinants which require an organisation to change their structure. One determinant within this theory is seen within the external environment. If the external environment is changing an adaptation process is required whereby this adaptation process can be achieved if the structure of an organisation is organic. See SCHREYÖGG, G. (2008), p. 277, STABER, U.; SYDOW, J. (2002), p. 409.

⁶² See CHAKRAVARTY, B. S. (1982), p. 37.

⁶³ See CHAKRAVARTY, B. S. (1982), p. 37.

⁶⁴ See CHAKRAVARTY, B. S. (1982), pp. 37-40.

⁶⁵ See CHAKRAVARTY, B. S. (1982), pp. 37-39.

⁶⁶ See CHAKRAVARTY, B. S. (1982), pp. 39-40.

Those two capacities determine the level of adaptive ability of a company. As discussed in the last chapter the capacity to adapt is system related and depends on internal factors. This is clearly a component of the definition here as well. On the contrary, to what we discussed within the last chapter, adaptive ability is exclusively caused internally. The focus of CHAKRAVARTY's work clearly is on organisational arrangement. The author views setting the right structure of a company as a strategy ("strategy of structure").⁶⁷ In short, adaptive ability defines / influences strategy and structure of a company and how companies achieve fit to a turbulent environment.

A more recent and contrary view on adaptive capacity is provided by STABER & SYDOW where AC is seen as a distinct concept to adaptation.⁶⁸ While CHAKRAVARTY states that the adaptive ability is precedent to the applied form of adaptation, STABER & SYDOW claim that AC should be seen as a strategy which is not aiming at achieving a state of fit to the environment.^{69,70} This challenge can be achieved by "improving ability to learn, to act reflexively and to maintain or transform social structures and processes".⁷¹ To explain how companies survive in uncertain environments they use the structuration theory of GIDDEN'S which is a social theory and observes the relationship between structure and human interactions. Since organisations are social systems this theory can be applied to understand social relations at an organisational and inter-organisational level.⁷² STABER & SYDOW assume that managing adaptive capacity and its properties can be explained by GIDDENS theory.⁷³ As the properties of AC the authors mention Multiplexity, Redundancy and Loose coupling.⁷⁴

Multiplexity^{75,76}

Multiplexity includes the number of actors and their complex relations. For example employees might be settled within one area of responsibility but will still be active within different settings and interact with employees from different areas. Within this interaction resources are exchanged. This phenomenon is described as highly differentiated knowledge structures. Within this structure information can be spread but success whether the right information are spread or not depends on structures.

⁶⁷ See CHAKRAVARTY, B. S. (1982), p. 35.

⁶⁸ See STABER, U.; SYDOW, J. (2002), p. 411.

⁶⁹ See STABER, U.; SYDOW, J. (2002), p. 408.

⁷⁰ There are 2 different streams of literature. One is called adaptationist strategies to fit to existing circumstances and the other stream considers that it is not the aim to achieve "fit" then rather being adaptive at any time which can also mean that a company is not as well adapted as it could be. See STABER, U.; SYDOW, J. (2002), p. 409.

⁷¹ STABER, U.; SYDOW, J. (2002), p. 412.

⁷² See STABER, U.; SYDOW, J. (2002), p. 412.

⁷³ See STABER, U.; SYDOW, J. (2002), p. 419. GIDDENS, from a social research background, investigated in human interactions, communication and structures. He states that social interactions are first and foremost through symbols possible and leads to a common construction of reality. His structuration theory gained importance within behavioural theories of firm as he explains the complexity of human communications in relation to structures within organizations. See STAEBLE, W. H. (1994), p. 54.

⁷⁴ See STABER, U.; SYDOW, J. (2002), p. 413ff.

⁷⁵ See STABER, U.; SYDOW, J. (2002), p. 414-416.

⁷⁶ The concept of Multiplexity derives from the social theory and within this context is not discussed within organisational studies. It is a concept of GIDDENS structuration theory.

Redundancy^{77,78}

Redundancy is viewed as resource slack. STABER & SYDOW see resource slack and as necessary to a certain amount as it contributes to the ability to cope with unforeseen challenges. This is especially the case for information, tasks and relations and its distribution. First, redundant information enhances reliability of its transmission. Secondly, redundancy of tasks ensures that even if a task is not done at a particular time it will be completed at another. Even if the accomplishment of the task failed at first the function of the organisation is still ensured. Finally, redundant relations ensure that information which can be carried by different actors will be spread within the network independent from the links between actors.

Loose coupling^{79,80}

Loose coupling means that units are independent and can adjust to changes in different ways. It is assumed that the tacit knowledge within one unit enhances the possibility that adaptation is achieved as at least one unit will be exposed to environmental changes.

These three dimensions of AC do not automatically ensure success within an organisation. They have to be managed in the right way. At this point the theory of GIDDENS becomes relevant. His theory is about the duality of structure which means that organisations have structures and experience human actions within these structures. GIDDENS states that human interactions and structures are related in the way that structure has enabling and constraining qualities.⁸¹ I do not go into detail about this as the focus is on AC and this relation is not required for the understanding of the concept of AC.

So far, we explored two important theories investigating in the concept of AC. Both authors are coming from the research field of organisational studies. As I investigate in climate change strategies one might wonder if there is no strategic theory contemplating the concept AC? Why not searching for a concept within strategic management literature which derives from the evolutionary context? Indeed, there is the evolutionary theory within strategic management. This theory aims at explaining why some companies survive and others do not survive.⁸² However, within this theory there is no term similar to AC. Within this theory the term "fit" is used and describes the extent to which a company is adapted to its external environment. The core statement of the evolutionary theory from a strategic point of view is that the pace of company's strategic adaptation should be faster than the pace of change within envi-

⁷⁷ See STABER, U.; SYDOW, J. (2002), p. 416-417.

⁷⁸ Redundancy is also a concept of organization theory and is discussed within the context of innovation. Slack has been used to describe "organisational phenomena including goal conflict, political behaviour, effectiveness and innovation itself." Recently it has been described as excess of resources including input resources, redundant employees, unused capacity and unnecessary capital expenditures. See NOHRIA, N.; GULATI, R. (1996), pp. 1245-1247.

⁷⁹ See STABER, U.; SYDOW, J. (2002), pp. 417-419.

⁸⁰ The concept of loose coupling is discussed within organisational structures especially within lateral organisation models. It is basically the organisation of teams or tasks in small, substantially closed and differentiated units. This ensures a higher system flexibility since every unit is independent. See SCHREYÖGG, G. (2008), p. 232.

⁸¹ See GIDDENS, A. (1984) cited in STAEBLE, W. H. (1994), p. 54.

⁸² Relevant authors within the evolutionary theory are for example HANNAN, M. T.; FREEMAN, J. H. (1977), NELSON, R. R.; WINTER, S. G. (1982), BURGELMAN, R. A. (1991), BARNETT W. P.; BURGELMAN, R. A. (1996), BURMANN, C. (2002). I remark, that the transference into strategic issues happened later than into organisational studies. The theory of evolution is more intensively discussed within organisation studies. See therefore BURGELMAN, R. A. (1991), p. 239 and SCHREYÖGG, G. (2008), p. 273ff.

ronment or at least the same.⁸³ Still, this finding might be of interest later within this work. Nevertheless, this does not provide any insights for the concept of AC at this moment. So far, it seems that research is lacking of empirical and theoretical attention to the concept of adaptive capacity. This has to be proved.

Resulting from that the following research questions derive:

Research Question 1:

*Is adaptive capacity a concept which made its way into the strategic management literature?
What is said about adaptive capacity?*

Research Question 2:

What determines adaptive capacity?

⁸³ See BARNETT W. P.; BURGELMAN, R (1996), p. 251.

2.2 Strategy and strategy formulation in the context of climate change

In the last chapter I gave an overview of adaptive capacity within different contextual frameworks. Within this chapter I briefly explain what strategy is, the process for strategy formulation. Then I discuss the integration of the climate change aspect into strategic issues. One may ask why even approach this from a strategic point of view? Strategic Management is about choosing a strategy to cope and fit into the environment.⁸⁴ As TOFFLER already stated in the early 1980s the external corporate environment has grown unstable, accelerative and revolutionary.⁸⁵ Companies are steadily facing a changing environment since external conditions change at all time. It is being discussed for a while now how companies should adapt to changing environments especially technological changes, changes in consumer behaviour or changes driven by competitors.⁸⁶

GÜNTHER gives a comprehensive overview about a company's scope of tasks and demands which has to be met. Hereby, the author classifies three levels of demands on a global, broad company specific and company specific scale. On a global scale these demands are changing political, technological, social, economical and ecological frameworks. The broad company specific tasks contain the demands of stakeholders and the company specific level includes all demands deriving from and related to the main company activities such as supplier, products, consumer behaviour or competitors.⁸⁷

Especially the ecological aspect is very complex since it has implications for every level of the above described demands. As HOFFMANN sums up the necessity for approaching this aspect strategically results from the fact that environmental problems are originated from a broader system of pressure.⁸⁸ Within this work the focus is on changing environments through climate change. Even though it is not new that the climate is changing, still it is not being paid enough attention within the strategic management literature.

This chapter answers the question:

- (1) What is strategy and how is a strategy formulated?
- (2) Is there a common scientific definition of climate change strategy?
- (3) How is the aspect of climate change integrated into strategy formulation?
- (4) Are there any differences to the usual strategy formulation process?

⁸⁴ See CHAKRAVARTY, B. S. (1982), p. 35.

⁸⁵ See TOFFLER, A. (1985), p. 91ff.

⁸⁶ See TUSHMANN, M. L.; O'REILLY III, C. A. (1996), p. 11.

⁸⁷ See GÜNTHER, E. (2008), p. 96ff.

⁸⁸ HOFFMANN, A. J. (2000), p. 10. See also TÄLBERG FOUNDATION (eds.) (2006), p. 4.

2.2.1 Defining and formulating a strategy

Strategic management itself and strategy is a relatively young research field. The transfer into business and management literature goes back to the definition given by CHANDLER in the 1960s.⁸⁹ His definition of strategy is seen as the classic understanding of a strategy.⁹⁰ CHANDLER defines strategy as “the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals.”⁹¹ The most important counter-position is the school thought of MINTZBERG who believes that strategy in most instances is not consciously planned and implemented according to it.⁹² PORTER interprets strategy from a more competitive view and states strategy as the creation of a unique and valuable position involving a different set of activities.⁹³ As we can see there are different definitions of strategy and there are countless more definitions.^{94,95} Taking the three given definitions above into account, there are three basic differences in the point of view about strategy. First, strategy is a way to achieve corporate goals. Secondly, strategy happens and at last, strategy is needed to achieve valuable competitive advantage. Within this work I follow the definitions of CHANDLER and PORTER which means that strategy is planned and is a way to achieve goals which does include the aim to achieve competitive advantage. Strategies can be formulated on different levels i.e., corporate level, business level and functional level.⁹⁶

As COLLIS states corporate strategy rests on the concept of resources, which are assets, skills and capabilities.⁹⁷ One might ask why focusing on corporate strategy. As CARPENTER & SANDERS state firms competing in a few industries focus on their business strategy.⁹⁸ I follow COLLIS assumption who states that organisations of every size make choices about the range of markets in which they compete which means that it is regardless whether it is a small manufacturing firm or a multinational company.⁹⁹ I further argue that since corporate strategy is the overall strategy of a (diversified) company and addresses any and every strategic issue a company is facing I concentrate on the corporate level of strategy.¹⁰⁰ As BARNEY states a corporate strategy is an action firms can take to gain competitive advantage by leveraging their resources and capabilities across several markets simultaneously.¹⁰¹

⁸⁹ See BURMANN, C. (2002), p. 68. Until the midst of the 20th century there has been no business definition for the word strategy. A transfer into business literature was first initiated by the game theory. See also STAEHLE, W. H. (1994), p. 573ff.

⁹⁰ See WELGE, M.K.; AL-LAHAM, A. (2003), p 13.

⁹¹ CHANDLER, A. D. Jr. (1991), p. 12.

⁹² See BURMANN, C. (2002), p. 68.

⁹³ See PORTER, M.E. (1996), p. 68.

⁹⁴ See WELGE, M.K.; AL-LAHAM, A. (2003), p. 12.

⁹⁵ For further definitions of strategy see PEARCE, J. A.; ROBINSON, R. B. Jr. (1988), GÜNTHER, E. (2008), BAUM, H.-G.; COENENBERG, A. G.; GÜNTHER, T. (2007). For further literature about the discussion of strategy definitions see WELGE, M.K.; AL-LAHAM, A. (2003), p. 12ff.

⁹⁶ See STAEHLE, W. H. (1994), p. 623, CARPENTER, M. A.; SANDERS, W. G. (2007), p. 8f. PEARCE & ROBINSON also discusses the characteristics of different levels such as profitability, time horizon, type, risk and so. Corporate Strategies can provide large profit potential but there is also the highest risk to formulating corporate strategies as they exhibit a long time horizon, low adaptability and high costs. PEARCE, J. A.; ROBINSON, R. B. Jr. (1988), p. 11.

⁹⁷ See COLLIS, D.J.; MONTGOMERY, C. A. (1997), p. 9.

⁹⁸ See CARPENTER, M. A.; SANDERS, W. G. (2007), p. 8.

⁹⁹ COLLIS, D. J.; MONTGOMERY, C. A. (1997), p. 5.

¹⁰⁰ See COLLIS, D.J.; MONTGOMERY, C. A. (1997), p. 5, PORTER, M.E. (1987), pp.43-59.

¹⁰¹ BARNEY, J. (1991), p. 103ff.

Until now, we got an impression of what strategy is but how are they formulated? Strategy formulation is a part of the strategic management process and is simply the process of deciding what to do.¹⁰² There are basically two streams of literature discussing the strategic management process. One stream of literature views this process from a market-oriented external view.¹⁰³ Recently, there has been another stream of literature which argues that formulating a strategy should be based on the resources of companies.¹⁰⁴ This stream of literature stresses the importance of internal resources and capabilities for a sustained competitive advantage.¹⁰⁵ There are two important facts underlying this point of view. First, as BARNEY stresses every company would pursue the same strategy if they would have the same identical resources.¹⁰⁶ Secondly, focusing on internal resources and capabilities is important as they determine what a company *can* do.¹⁰⁷ This means that the direction of analysis is different between the market-based and the resource-based view. Internal frameworks are far more important. Based on these arguments and the assumed endogenous character of adaptive capacity it seems obvious that I concentrate on the resource-based view (abbreviated with RBV) on strategy.¹⁰⁸

Still, the approach for formulating a strategy is not strongly differing between both streams of literature. All authors regardless if approached from a market oriented view or the RBV state basically 3 main actions which have to be done when formulating a strategy.¹⁰⁹ Define the Vision, Goals and Objective of your company, analyse the external environment (opportunities & threats) and the internal analysis (strength & weaknesses).¹¹⁰ I refer to the strategy formulation given by COLLIS & MONTGOMERY as they approach it from the RBV. They state that an effective corporate strategy is a set of five elements leading to corporate advantage.¹¹¹ Figure 2 shows these five elements and their relation.

¹⁰² CARPENTER, M. A.; SANDERS, W. G. (2007), p. 10.

¹⁰³ See STAEHLE, W. H. (1994), p. 575f. This stream of literature refers to the Harvard concept of strategic planning and implementation of strategy. Some authors do not explicitly refer to the Harvard Concept but are approaching strategy formulation from the same point of view. See therefore PORTER, M. E. (1992), 49ff., TÖPFER, A. (2005), p. 517ff. and PEARCE, J. A.; ROBINSON, R. B. Jr. (1988), p. 71ff.

¹⁰⁴ See STAEHLE, W. H. (1994), p. 578, COLLIS, D.J.; MONTGOMERY, C. A. (1997), p. 22f. and CARPENTER, M. A.; SANDERS, W. G. (2007), p. 20. The resource-based view is being discussed since the early 1990s. It should be noted here that the resource-based view is not yet a central premise within strategic management literature. See WERNERFELT, B. (1995), p. 172. The market-oriented view is still dominating.

¹⁰⁵ See STAEHLE, W. H. (1994), p. 579., CARPENTER, M. A.; SANDERS, W. G. (2007), p. 66, BARNEY, J. (1991), pp. 101f., WERNERFELT, B. (1984), p. 171f.

¹⁰⁶ See BARNEY, J. (1991), pp. 99-120.

¹⁰⁷ See COLLIS, D. J.; MONTGOMERY, C. A. (1997), p. 9.

¹⁰⁸ It should be noted here that the resource-based view can also be approached from a dynamic perspective. See CARPENTER, M. A.; SANDERS, W. G. (2007), p. 19-21. Within the dynamic perspective the concept of dynamic capabilities evolved and is associated with the RBV. It extends the RBV as it goes beyond just aiming at the "fit" to external environment. The dynamic capabilities focus on competencies and their long-term importance for firm survival and the ability of companies to adapt their core competencies to changing environments. See therefore EASTERBY-SMITH, M.; LYLES, M. A.; PETERAF, M. A. (2009), p. S1f. and TEECE, D. J., PISANO, G.; SCHUEN, A. (1997).

¹⁰⁹ The division of steps when formulating a strategy varies by author. For further literature on strategy formulation and steps see PEARCE, J. A.; ROBINSON, R. B. Jr. (1988), CARPENTER, M. A.; SANDERS, W. G. (2007), STAEHLE, W. H. (1994).

¹¹⁰ See STAEHLE, W. H. (1994), p. 586-605,

¹¹¹ See COLLIS, D. J.; MONTGOMERY, C. A. (1997), p. 7.

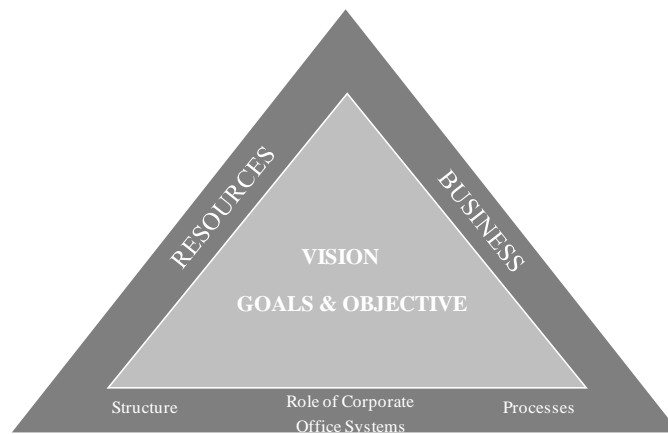


Figure 2: Strategic triangle of corporate strategy
(Source: COLLIS, D. J.; MONTGOMERY, C. A. (1997), p. 7.)

As exhibited in Figure 2 Vision, Goal and Objective of the company are the core of strategy formulation.

The *Vision* includes knowing where the company will be in the future. The vision is also crucial for the employees as motivation: “When the vision captures the contribution the company is making to society, it can provide meaning and fulfil that vision over an extended period of time.” This means the vision of corporate strategy is long-term orientated. It further includes defining boundaries which means businesses the corporation will not and will go into. Moreover, it describes the ethical value of a company including code of behaviour by which employees are governed such as “treating all stakeholders with fairness and respect”.¹¹²

Goals & Objectives describe shorter term goals set as milestones for fulfilling a company’s vision. These include short-and medium term quantitative targets such as “sustain 40% debt/equity ratio” as objectives and qualitative intentions as goals such as “become a global organisation”.¹¹³

Resources include tangible, intangible assets and organisational capabilities of a firm. Tangible assets are the easiest to value since they include real estate, production facilities, raw materials and other. Intangible assets on the other side are hard to value since they contain company reputation, brand names, cultures, tacit knowledge, patents and other. Organisational capabilities are a complex combination of assets, people and processes and are a set of abilities describing efficiency and effectiveness i.e., faster, more efficient, higher quality and so forth.¹¹⁴ In the dynamic perspective this would be resources and capabilities which strengthen the firm’s ability to embrace continuous and sometimes disruptive change.¹¹⁵

¹¹² See COLLIS, D. J.; MONTGOMERY, C. A. (1997), p. 7f.

¹¹³ See COLLIS, D. J.; MONTGOMERY, C. A. (1997), p. 8f.

¹¹⁴ Within the RBV it is being discussed what makes resources valuable to sustain competitive advantage. As BARNEY states they have to be valuable, rare, inimitable or non-substitutable and exploitable. See BARNEY, J. (1991), p. 106ff. This is often referred to the VRINE-model. See CARPENTER, M. A.; SANDERS, W. G. (2007), p. 68.

¹¹⁵ CARPENTER, M. A.; SANDERS, W. G. (2007), p. 21.

Business refers to the industry where the company is operating in and competitive strategies they adopt in these industries. It also includes the analysis of strength & weaknesses and opportunities & threats presented by its external environment.¹¹⁶

Structure, Systems and Processes determine how organisations coordinate activities among units and staff. Structure hereby means the hierarchy and the organisational structure of a company.¹¹⁷ Systems are a set of policies which define how tasks have to be fulfilled and processes are the internal personal networks and work-flows.¹¹⁸

2.2.2 Integrating the aspect of climate change

So far, we know what strategy is and what influences the formulation of strategies. In the following, when I use the term strategic management it means strategy and strategy formulation. The aspect of strategy implementation is not considered exclusively within this work.¹¹⁹ One might ask: what does this have to do with the climate change aspects? The need for approaching strategic management from this point of view was already explained at the beginning of chapter 2.2. At this point, there are two important questions coming up:

- (1) Is there a common definition of climate change strategies?
- (2) How can the climate change aspect be integrated into strategic management?

The first question can be answered with no. Hitherto, there is no common definition of a climate change strategy. When searching for a definition of climate change strategy within classic strategic management literature one will find several terminologies such as environmental strategies, integrating ecological aspects into strategies, sustainable development and environmental competitive strategies.¹²⁰ Often types of strategies are also described by different adjectives or substantives within the literature e.g., active, passive, interactive, reactive, proactive, selective or anticipation, adaptation, resistance and more.¹²¹

The integration of environmental aspects into strategic management

GÜNTHER states that ecological aspects shall be integrated into corporate strategic goals under economic and monetary constraints such as a positive impact on economic key values.¹²² This is truly inevitable since companies still need to ensure competitive advantage and survive. If the economical aspect would be ignored than companies might be sustainable but would not survive any minute within the competitive environment. Within strategic management literature the approach when discussing environmental aspects within strategic management differs between authors. Some authors distinguish between behavioural integrations of these as-

¹¹⁶ CARPENTER, M. A.; SANDERS, W. G. (2007), p. 10.

¹¹⁷ This follows the assumption of CHANDLER, A. D. Jr. (1991) who stated that structure should be based on the strategy and should be customized to fit resources and businesses. See therefore chapter 2.1.3.

¹¹⁸ CARPENTER, M. A.; SANDERS, W. G. (2007), p. 10f.

¹¹⁹ I do focus on formulation but I remark that the implementation is just as important as the stage of formulating strategies. A company cannot formulate strategies without considering what comes after the strategy is formulated. I argue that for this work a clear distinction is not necessary as strategy formulation and implementation are closely linked. In the following if I speak of strategic management I mainly refer to strategy formulation.

¹²⁰ See HOFFMANN, A. J. (2000), ROBBINS, P. T. (2001), GLADWIN, T. N.; KENNELY, J. J.; KRAUSE, T.-S. (1995), HART, S. L. (1995), SHARMA, S.; VREDENBURG, H. (1998), BURSCHE, C.; LOSEN, D.; WIENDL, A. (2004), STAEHLE, W. H. (1994), SCHIERENBECK, H. (2003).

¹²¹ See GÜNTHER, E. (2008), p. 28.

¹²² See GÜNTHER, E. (2008), p. 23. See also HOFFMAN, A. J. (2000), p. 10.

pects.¹²³ Some authors discuss possible business strategy solutions. Nevertheless, the basic underlying discussion, no matter which way to distinguish the integration of environmental aspects into strategic management, is that companies give these aspects different roles within their companies. This fact is important since the role companies give environmental aspects determine their applied strategies.¹²⁴ As I discussed within the last chapter the basis when formulating a strategy is deciding on vision, mission and goal. This is the same for an environmental strategy. If these aspects would play a more important role on a corporate level thus within the corporate strategy than a company and its activities will become more sustainable.¹²⁵

Considering PORTER'S competitive strategies¹²⁶ i.e., cost leadership, product differentiation and focus, environmental aspects can be integrated by reducing energy costs through energy efficient implementation measures or waste minimization (cost leadership) or selling products with a higher benefit for the environment (product differentiation).¹²⁷ MEFFERT & KIRCHGEORG provide a very detailed overview of environmental impacts on basic strategic decisions.¹²⁸ In short, environmental aspects have implications on strategic technological transaction-related, quality and cost-related, product and process-based and also risk related decisions.¹²⁹ A different view on these issues which is related to the above described resource-based view of formulating strategies is provided by HART who developed a natural resource based view. This adds to the strategic actions the aspect if companies can implement these strategies and how they will gain and sustain competitive advantage by integrating environmental aspects.¹³⁰ Therefore, HART discusses, a company needs to establish capabilities that facilitate environmentally sustainable economic activity.¹³¹ Within this context he mentions three strategic capabilities (and relating key resources): pollution prevention (continuous improvement), product stewardship (stakeholder integration) and sustainable development (shared vision).¹³²

¹²³ See REINHARDT, F. L. (2000), p. 17-177 as cited in GÜNTHER, E. (2008), pp. 23-28. See also MEFFERT, H.; KIRCHGEORG, M. (1998), p. 196ff. For example SCHIERENBECK only states that environmental aspects brought up a defensive and an offensive strategy. See SCHIERENBECK, H. (2003), pp. 70-71. KREIKEBAUM discusses that further and states that the only implication for strategic planning is reducing the use of resources, recycling strategies, usage of environmental friendly technologies, environmental friendly product policy and active environmental protection. KREIKEBAUM, H. (1987) as cited in STAEBLE, W. H. (1994), p. 593f.

¹²⁴ GÜNTHER, E. (2008), p. 23.

¹²⁵ See for example ROBBINS who says that that environmental aims should be incorporated into overall economic strategy of companies.¹²⁵ He further states that this is the most proactive style which can be approached with regard to environmental issues since it "goes beyond environmental audits and accounting and moves towards cradle-to grave analyses, environmental research and development and other environmental aims and objectives". See ROBBINS, P. T. (2001), p. 61. This also means environmental aspects are either seen as exogenous goal which has to be met or as more than just given externally and as something the company can influence proactively which means exceeding external demands such as regulations. See therefore GÜNTHER, E. (2008), p. 23ff. and MEFFERT, H.; KIRCHGEORG, M. (1998), p. 195 ff. SHARMA & VREDENBURG also provide a brief overview of streams of literature on environmental role within strategic management. See SHARMA, S.; VREDENBURG, H. (1998), pp. 729-731.

¹²⁶ See PORTER, M. E. (2004), p. 34-46. PORTER'S work and his three generic strategies are fundamental strategies and had a great impact on strategic management literature.

¹²⁷ See REINHARDT, F. L. (2000), pp. 17-177 as cited in GÜNTHER, E. (2008), pp. 25-28.

¹²⁸ See MEFFERT, H.; KIRCHGEORG, M. (1998), p. 195ff.

¹²⁹ See summary of basic strategic decisions when integrating environmental aspects. MEFFERT, H.; KIRCHGEORG, M. (1998), p. 196.

¹³⁰ See HART, S. L. (1995), p. 986ff.

¹³¹ HART, S. L. (1995), p. 991.

¹³² HART, S. L. (1995), p. 992.

Now we know the basics on integrating environmental aspects discussed in scientific literature so far. It is basically a decision on being proactive or reactive and deciding on the role these aspects have within the overall strategic decisions. However, all of the above stated authors refer to an environmental strategy but none of them uses the term climate change strategy. So far, no scientific definition of a climate change strategy was provided. What does that imply? Can we just use climate change strategy interchangeably for environmental strategies? Is there simply no definition for climate change or is climate change strategy a new type of strategy? Is there a need to distinguish between CCS and environmental strategy? Intuitively, one might argue that implications of environmental aspect will be the same for climate change aspects but what is a CCS? One might further wonder that the term CCS itself may not be sound. More insights to a definition of CCS are given by the recently discussed climate change adaptation strategies as they aim at explaining how to adapt to climate change. The need to address climate change from a strategic side has been discussed within chapter 1.

Approaching a definition of a Climate Change Strategy

So far, it has been discussed intensively on a policy level within climate change adaptation research but it is increasingly being discussed on a business level. The PEW CENTRE ON GLOBAL CLIMATE CHANGE, the TÄLLBERG FOUNDATION and the NETWORK FOR BUSINESS SUSTAINABILITY hereby invested into research on current company responses to climate change.

NITKIN/FOSTER/MEDALYE on behalf of the NETWORK FOR BUSINESS SUSTAINABILITY investigated in a systematic review on business adaptation strategies to climate change. The key findings were that there is no common definition on climate change adaptation strategies within science and practice.¹³³ The TÄLLBERG FOUNDATION contemplated research in the support of business leaders in developing strategic response to the effect of climate change.¹³⁴ The report of HOFFMAN on behalf of the PEW CENTRE ON GLOBAL CLIMATE CHANGE further examines steps needed to be taken to formulate strategy related to climate change and define these strategies as climate-related strategies “defined as the set of goals and implementation plans within a corporation that are intended to reduce GHG emissions, produce significant GHG-reduction co-benefits, or that otherwise respond to climate-related changes in markets, public policy, or the physical world”.¹³⁵ Within his afterwards published book: “Climate Change: What’s your business strategy” HOFFMAN & WOODY use a reduced definition of the term climate change strategy as a strategy to address risks of climate change by setting goals and implementing measure to reduce the company’s carbon footprint.¹³⁶

Climate change adaptation

As stated above adaptation is one of the strategies to address climate change which is seen as central strategy in dealing with impacts of climate change.¹³⁷ As every industry is facing different risk and opportunities of climate change the adaptation strategies vary between sectors.

¹³³ See NITKIN, D.; FOSTER, R.; MEDALYE, J. (2009a), p. 5.

¹³⁴ See TÄLLBERG FOUNDATION (eds.) (2006), p. 3.

¹³⁵ See HOFFMAN, A. J. (2006), p. 3.

¹³⁶ See HOFFMANN, A. J.; WOODY, J. G. (2008), p. 24ff.

¹³⁷ See NITKIN, D.; FOSTER, R.; MEDALYE, J. (2009a), p. 5.

As stated by NITKIN/FOSTER/MEDALYE to the leading industries in adaptation belong the insurance, agriculture and tourism sector.¹³⁸ These adaptation strategies range from technological i.e., innovation of new and green technologies, change in used materials, modular systems and reuse and recycling systems, managerial i.e., network building, commitment in industry and worldwide organisations over financial i.e., insurance coverage, catastrophe bonds and weather related international trading markets to behavioural measures.¹³⁹ One might argue that most of these strategies are rather applied on an operational business level which means that these strategies described here can be seen as implementing strategies.¹⁴⁰ Within chapter 2.2.1 the different levels of strategy and the step before the implementation of strategy was discussed. Therefore, it seems necessary to find a definition of CCS from a corporate level. Hereby, the TÄLLBERG FOUNDATION and HOFFMAN provide interesting insights.

Corporate climate change strategy

What does it mean approaching climate change at a corporate level? The TÄLLBERG FOUNDATION mentions three main key findings which have to be thought about: How will the market place of tomorrow change through climate change? What will the policy framework be like? What is the need of integrating education in the heart of the company including the education of current managers and best practice sharing?¹⁴¹ HOFFMAN discusses similar key points which have to be kept in mind when approaching climate change strategically. He also mentions the policy development aspect and the market opportunities and adds to this the aspects of strategic timing and establishing an appropriate level of commitment.¹⁴² Within both reports it becomes clear that climate change need to become part of the inner core of a company, thus the corporate strategy.¹⁴³

All these questions and aspects are mostly external factors and determine and provide an ex ante perspective of factors which have to be included when planning or formulating strategic response. This leads us to the theory of how to formulate a strategy which was discussed within the last chapter 2.2.1. We pointed out that there are three main stages: setting goals, internal analysis and external analysis. HOFFMANN defines three stages and eight steps which are compared to the theory of COLLIS & MONTGOMERY as shown in Table 4.¹⁴⁴

Clearly, the CCS discussed within this report relates to a carbon-constrained world which means that GHG emissions will be increasingly regulated and will have to be steadily controlled and reduced by companies. As a result a CCS requires setting goal & objectives on GHG emissions. Gauging risk and opportunities, formulate policy strategy, manage external relations can be seen as external analysis. The steps assessing emissions profile, evaluate ac-

¹³⁸ See NITKIN, D.; FOSTER, R.; MEDALYE, J. (2009b), p. 42.

¹³⁹ For the whole list of adaptation strategies by industry sector see result from the systematic review on current practices on business adaptation strategies from the NETWORK FOR BUSINESS SUSTAINABILITY. See NITKIN, D.; FOSTER, R.; MEDALYE, J. (2009b), pp. 13-42.

¹⁴⁰ See HOFFMANN, A. J. (2006), p. 3. He also mentions activities which should be applied to address climate change such as “measures for achieving direct and indirect emission reductions from a company’s own operations (such as energy efficiency initiatives); research, development, and investment in low-carbon production and process-related technologies as well as climate-related financial and business services; reductions obtained through emissions offsets and trading; activities to reduce “upstream” or “downstream” emissions along the value chain; and adaptation strategies.”

¹⁴¹ TÄLLBERG FOUNDATION (eds.) (2006), p. 3.

¹⁴² See HOFFMAN, A. J. (2006), p. 6f.

¹⁴³ See TÄLLBERG FOUNDATION (eds.) (2006), p. 23f. and HOFFMAN, A. J. (2006), pp. 4-7.

¹⁴⁴ See HOFFMAN, A. J. (2006), p. 8ff.

tion options and engage the organisation can be referred to thinking about internal structures, processes and systems. Finally, the assessment of internal resources and capabilities are to some extent covered by the step of developing financial mechanisms.

Table 4: Steps of formulating a climate change strategy

Hoffman		Collis & Montgomery	
Develop a CCS	Assess emissions profile	What kinds of direct and indirect GHG emissions are being created, from what sources, and in what quantities? What metrics can be used to track emissions, and what technologies or techniques are required to measure them?	Think about internal structures, process and systems
	Gauge Risk and Opportunities	What risks are posed by emissions from operations and GHG intensity of products and services? Where can we excel and get ahead of peers in climate friendly or risk reducing business lines? How may demand for products and services change? What products and services may flourish given carbon constraints?	External analysis of Business and Industry
	Evaluate Action options	What options are available for reducing emissions? Are there any “low-hanging” emission-reduction opportunities? Where can we innovate? What long-run steps can be taken? How can climate-related strategies enhance top-line and bottom-line objectives?	Think about internal structures, process and systems
	Set goals and targets	Why set GHG reduction targets? What kinds of efficiency or reduction targets should be set, and over what time period? How do efficiency improvements relate to GHG reductions? How can targets be connected to business strategy? What kind of goals are achievable regarding new business opportunities? What kind of adaptation strategies should be considered?	Set visions and according goals & objectives
Focus Inward	Develop financial mechanisms	What financial instruments are available to support GHG reductions? What are the pros and cons of emissions trading (internal and external), carbon shadow pricing, lower hurdle rates, and special capital reserves?	Assess your internal resources and capabilities
	Engage the organisation	How can buy-in from the workforce be achieved? How important is senior leadership? Where are the sources of support and resistance? How can resistance be overcome? How can climate-related activities move from the periphery to the core?	Think about internal structures, process and systems
Focus outwards	Formulate policy strategy	How might possible policies help or hurt business and/or ongoing climate-related activities? What policy options are on the table? What is a desirable policy outcome? What are the best ways to influence climate policy at the state, national, or international level?	External analysis of Business and Industry
	Manage external relations	What external constituents are important to the success of climate related strategies? How should they be engaged?	External analysis of Business and Industry

(according to HOFFMAN, A. J. (2006), p. 5 and COLLIS, D. J.; MONTGOMERY, C. A. (1997), p. 7ff.)

In conclusion, Hoffman's way to approach formulation of a strategy differs to Collis & Montgomery's steps in two points:

- The aspect of the *vision* is missing, such as: What is the company's overall vision? What position should the company aim at?
- The aspects of *internal capabilities and resources* are only covered by financial aspects: Can we establish resources related to climate change which distinguishes our company from peers?

Indeed it can be said, that the focus of HOFFMAN lies on an external analysis. I argue that CCS formulation must also examine the internal resources and capabilities beyond technological and financial options as these constrain a company's ability to adapt which is was stressed by HART and CHAKRAVARTY.¹⁴⁵ Within the RBV internal resources and capabilities are seen as antecedents to strategies. I argue that it should be proved whether AC is a special antecedent capability to a strategy.

Taking the discussed definitions into account a climate change strategy can be defined as a strategy addressing the risks and opportunities by *adapting* to climate change effects, *reducing* a company's *carbon footprint* and generating *new market opportunities* by thinking about the upcoming *policy framework*, an appropriate *level of commitment* to shape these framework, *strategic timing* and *education within company*. When formulating a climate change strategy the steps are not strongly different but still the topic of climate change adds to the current classic understanding of strategy formulation in the following ways:

- The aspect of climate change and its impact whether direct or indirect are highly complex and will be apply for every level within a company's task environment.
- It should be seen as a fundamental strategy which needs to be in the core of the company and should be approached proactively.¹⁴⁶
- There is an even higher necessity for communicating with external stakeholders since companies cannot deal to the full extent with the climate issue on their own.
- Moreover, there is no one-fits-all solution and there might not be a couple of generic strategies such as PORTER'S generic strategies.

As there is hitherto no clear scientific definition of CCS the search will be extended to environmental strategies as well since this is a common scientific term and CCS can be seen as a part of environmental strategy and if we will find interesting insights on factors and aspects influencing a formulation of an environmental strategy this might provide interesting insights for CCS as well.

¹⁴⁵ See HART, S. L. (1995), p. 998f. and CHAKRAVARTY, B. S. (1982), p. 37.

¹⁴⁶ See HOFFMANN, A. J. (2006), p. 61. This goes back to the results from the survey reported within the paper and is the common view of companies questioned within the survey. For methodology and companies included see the whole report.

Resulting from these facts the following research questions derive:

Research Question 3:

Can adaptive capacity in fact be linked to strategy formulation and to a climate change strategy?

Research Question 4:

Is adaptive capacity antecedent to climate change strategy?

Within this chapter I introduced the theoretical background on the topics of adaptive capacity and climate change strategy. I pointed out that adaptive capacity is originated within different research contexts and that it was so far mainly discussed within the context of the concepts of vulnerability, resilience and adaptation. If it was discussed within business context it is contemplated within organisational theory. Adaptive capacity is a multidimensional concept as it is determined by several factors. These vary depending on the author from internal to external factors whereas the organisational researchers AC relate to internal factors. Researchers from the climate change research field also add external factors constraining AC such as infrastructure including the access to resources. Both research fields inherent is, that authors confer AC with a set of resources and capabilities. Furthermore, AC can be basically defined as the ability to learn, use opportunities and adapt to changing conditions. Its relation to adaptation on the contrary varies between the view on AC between concepts (discussed in chapter 2.2.2) and organisational theory. Whereas the former sees adaptation as a manifestation of AC, STABER & SYDOW from an organisational background stress the fact that AC should not be mixed with adaptation and should be seen as an adaptation option itself. In the second part of the theoretical background I explained strategy and strategy formulation in the context of climate change. I defined strategy as a way to achieve long-term goals of a company. I explained the formulation of strategy based on the resource-based view which includes the focus on internal conditions determining the formulated and applied strategy. I argued that the RBV is considered since AC is discussed as a capability of a system. Thus, if formulating a CCS a company should consider its internal capabilities including their AC. Then I examined definitions of CCS within strategic management literature and other relevant authors, coming up with a definition of CCS including the adaption of climate change effects, setting goals for reducing the carbon footprint and new market opportunities. Based on all the above mentioned facts four research questions derived.

3 Methodological approach

*“The important thing in science is not so much to obtain new facts
as to discover new ways of thinking about them.”*

William Lawrence Bragg

In the last chapters I introduced the concept of adaptive capacity, strategy and their connection to climate change. The following section explains the fundamental method applied within this work and its realization. Therefore I first discuss: What is a systematic literature review? How is a systematic literature review (Chapter 3.1) carried out? Then I focus on developing search terms to explore relevant literature (Chapter 3.2), followed by the development of a data extraction sheet for describing the collected material (Chapter 3.3). The last Chapter in this section (Chapter 3.4) concentrates on developing a coding sheet for a qualitative content analysis and its realization within this work. This coding sheet is the basis for the systematisation of literature.

3.1 Doing a systematic literature review

One may ask: why doing a literature review? A literature review is an important research tool, especially in emerging areas, where the amount of studies is small. In this case a literature review can be used to explore new hypotheses or new ways of thinking about a topic. Literature reviews are also applied in research field where the number of studies is exploding.¹⁴⁷ This means that there are two main reasons for conducting literature reviews: conducting primary research or as an end in itself.¹⁴⁸ Hereby, an end in itself means that the systematic literature review aims to substitute for earlier papers by synthesizing existing research findings.¹⁴⁹

There are many terms that sometimes are used interchangeably to label the activities of a literature review.¹⁵⁰ These are terms like literature review, research review, integrative review, research synthesis, and meta-analysis.^{151, 152} Some of them just differ in scope which means that some are broader, and some are narrower in meaning, whereas, the literature review is the broadest term.¹⁵³ It can be said that the term literature review is the overall term for research synthesis, integrative review and the other above mentioned methods.¹⁵⁴ A new term is called a systematic literature review. For this thesis we apply a systematic literature review which differs from the literature review in its methodology. As LITTEL states the systematic literature review is bounded to more methodological standards such as transparent procedures to identify, assess and synthesize research results.¹⁵⁵ This allows the reader to critically appraise and to replicate the review.¹⁵⁶ It aims to analyse the literature as objective as possible supported

¹⁴⁷ See MERTENS, D. M. (2005), p. 87.

¹⁴⁸ See MERTENS, D. M. (2005), p. 88.

¹⁴⁹ See PRICE, D. J.D.S. (1965), p. 515, cited in GÜNTHER, E.; HOPPE, H. (eds.) (n. d.), p. 2.

¹⁵⁰ See COOPER, H. (1998), p. 3.

¹⁵¹ See COOPER, H. (1998), p. 3.

¹⁵² For further information on research synthesis and a detailed overview of different types of reviews, their approach, advantages and disadvantages see WEBB, C.; ROE, B. (2007) and GÜNTHER, E.; HOPPE, H. (eds.) (n.d.)

¹⁵³ See COOPER, H. (1998), p. 3.

¹⁵⁴ See COOPER, H. (1998), p. 3.

¹⁵⁵ LITTEL, J. H. (2004), p. 449.

¹⁵⁶ See LITTEL, J. H. (2004), p. 449.

by statistical methods if feasible and appropriate.¹⁵⁷ Statistical methods for assessing the results might include a meta-analysis, which depends on the collected material. A meta-analysis should be integrated, if the generated studies address an identical conceptual hypothesis.¹⁵⁸ GLASS, MCGAW & SMITH see meta-analysis as a supplement to COOPER's 5 steps for a review using regression models as statistical tool.¹⁵⁹ Following this strict definition a meta-analytical approach does not apply for this work.¹⁶⁰ As I already mentioned this work is qualitative in nature and meta-analytical approaches are unable to cope with variation in studies such as study design, different contexts and differing types of analysis.¹⁶¹ However, this work is supplemented by using descriptive statistical methods to describe the literature pool.

A systematic literature review is usually divided into 4 or 5 steps depending on the author. Table 5 gives an overview of the steps by different authors according to GÜNTHER & HOPPE.

Table 5: Steps in a systematic review

	Cooper (1998)	Fink (2005)	Togerson (2003)	Littell (2008)
1	Problem formulation	Selecting research questions Selecting bibliographic or article databases, web sites or other sources Choosing search terms (find appropriate articles, books & reports), based on research questions	Preparation of a plan or review protocol Determination of the inclusion and exclusion criteria.	Topic formulation Overall study design Sampling
2	Data collection	Applying practical screening criteria (select relevant articles, exclude others) ex: language, setting, funding source	The actual literature search and screening	Data collection
3	Data Evaluation	Applying methodological screening criteria (criteria to evaluate the adequacy of coverage and scientific quality) Review (use standardized form for abstracting data from articles)	Description and classification of the retrieved material. Data extraction and quality appraisal	Data analysis
4	Analysis and Interpretation	Synthesizing results (descriptive: interpretation of review findings / experience and quality /content of literature; meta analysis (special synthesis type) involves use of statistical methods to combine results)	Synthesis of the results from the data extracted from the material. This step may include the procedures of a meta-analysis.	
5	Public Presentation		Preparation of a report	Reporting

(Source: GÜNTHER, E.; HOPPE, H. (eds.) (n.d.), p. 5.)

As we can see in Table 5, the definitions of steps vary slightly between the authors. FINK gives a more detailed description for the realization of steps. The development of the system-

¹⁵⁷ CLARKE, M. (2007), p. 3 in WEBB, C.; ROE, B. (2007), pp.1-9.

¹⁵⁸ See COOPER, H. (1998), p. 108.

¹⁵⁹ GLASS, G. V.; MCGAW, B.; SMITH, M. L. (1981), p. 21.

¹⁶⁰ The term meta-analysis is being discussed since GLASS et al. first defined the term meta-analysis in 1981. The discussion is about what meta-analysis really is. Some authors see meta-analysis as the technique to synthesize former studies by using statistical methods, such as regression models. Other authors see meta-analysis just as a summary of former research findings. Since it is not applied within this context, we will not go into detail about this methodology. For profound information on meta-analysis see relevant authors such as: GLASS, MCGAW & SMITH (1981); FRICKE (1985); LIPSEY, M.; WILSON, D. B. (2001) and COOPER, H. (1998).

¹⁶¹ See NITKIN, D.; FOSTER, R.; MEDALYE, J. (2009), p. 14.

atic review applied within this work was mainly lead by the steps given by COOPER and GÜNTHER & HOPPE.¹⁶² Figure 3 shows the applied framework and steps for this work.

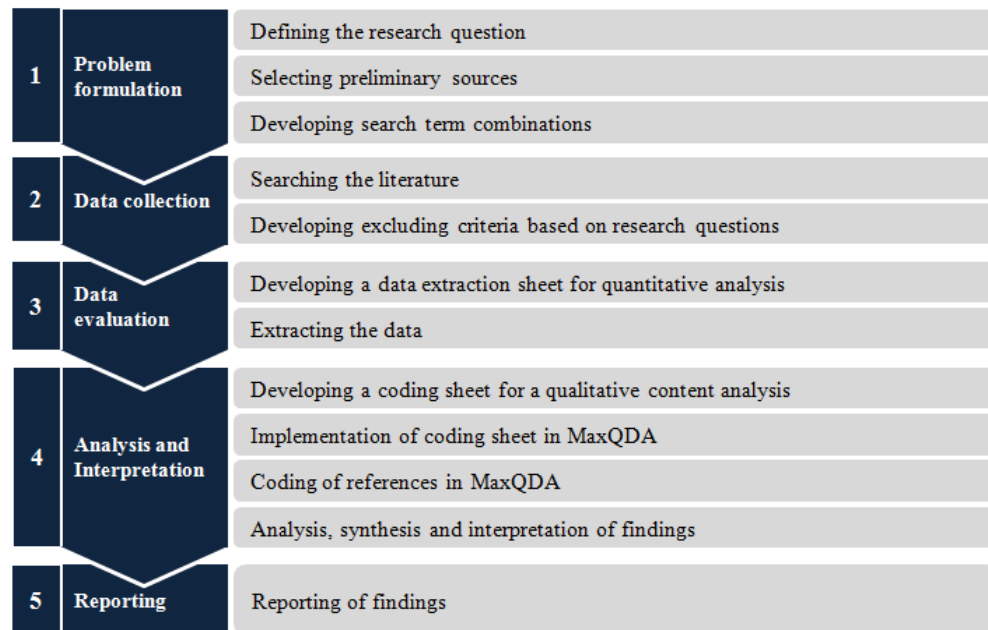


Figure 3: Modified methodological framework applied in this work
(According to: COOPER, H. (1998), p. 12ff.)

Within the **first step** - Problem formulation - I defined the problem by formulating research questions. The scope of a research question can be either broad i.e., about a relationship of two variables), narrow i.e., what increases a variable or specific e.g., does variable X increases Y.¹⁶³ Within this work I formulated a broad research question. In Chapter 2 I already explored that only a broad research question is obvious, since the topic is a relatively young research topic and I assumed that it might be possible that only a few studies discuss the relationship of AC and CCS. Then, I selected preliminary sources for the research and choose corresponding search terms. In chapter 3.2 I go into detail about selected databases and defined search terms. In chapter 0 I explain which preliminary sources have been searched.

Within the **second step** - data collection - the data was collected and it was decided which literature is included in further analysis. Therefore I developed practical screening criteria. Within Chapter 3.3 the data collection will be discussed more detailed.

The **third step** - the data evaluation – included the application of a data extraction sheet. This sheet was developed based on GÜNTHER & HOPPE and included bibliographic and descriptive information of references. The full data extraction sheet will be presented in Chapter 3.3. The abstraction of data from the article was also done within this step.

After that, in the **fourth step**, I analysed and interpreted the search results. Therefore I created a coding sheet for a qualitative content analysis. The coding sheet was implemented in MAXQDA and was used on the references. MAXQDA is a software for organising paper in

¹⁶² For a detailed explanation on single steps see COOPER, H. (1998), p. 12ff. and GÜNTHER, E.; HOPPE, H. (eds.) (n.d.), p. 5ff.

¹⁶³ See JACKSON, G. B. (1980), p. 438f.

groups, develop system of categories and various other functions supporting a qualitative data analysis.

Finally, in the **fifth step** follows the reporting of findings. These findings are presented in Chapter 4.

3.2 Searching the literature

In the previous chapter I stressed the importance of a systematic constructed methodological approach. This chapter covers the step of defining search terms and deciding on databases searched to ensure an effective literature research. In the following section, I explain the derivation of possible search terms with regard to the main research questions.

Planning the literature search

In chapter 2.1.2 I pointed out, that adaptive capacity is a broad term and that there are multiple definitions for it. The search terms were derived based on these findings. The search was limited to English literature as it is a young research topic and it is assumed that author discussing this topic within their research tend to report in English to reach a wider audience. In order to identify other English synonyms the OXFORD THESAURUS¹⁶⁴ was used. With regard to the main research questions

- (1) Is **adaptive capacity** defined within the strategic management literature? (Subject of Study)
- (2) How can Adaptive Capacity be linked to **strategy** development and climate change strategy within **companies** (level of examination)?
- (3) Is Adaptive Capacity antecedent to **Climate Change Strategy**? (with regard to)

the following combinations of search terms resulted. Figure 4 shows the combination of search terms which consists of 3 core issues: the subject of this study, the relation to strategic issues, especially strategic issues related to climate change and the level of examination.

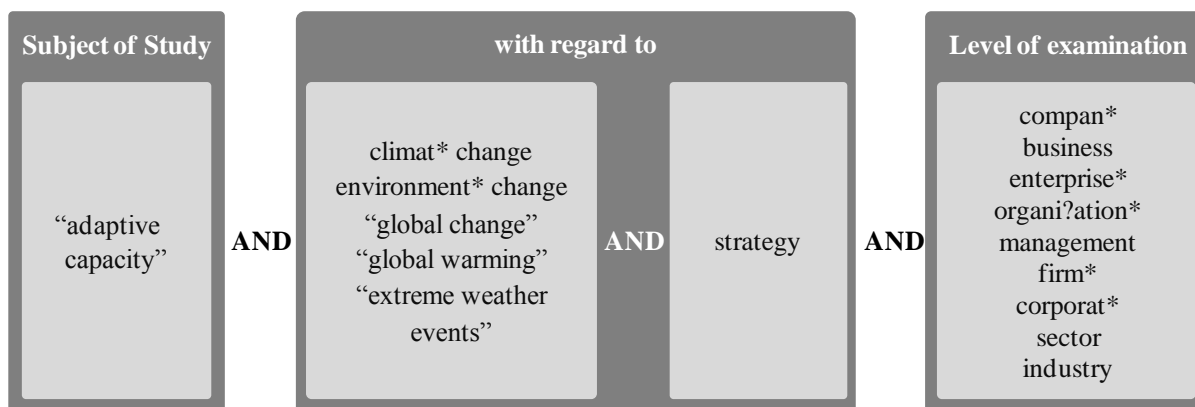


Figure 4: Search terms and combinations
(Own illustration.)

Hence, 45 combinations resulted. Exemplarily, the first combination resulting is: “adaptive capacity” AND climat* change AND strategy AND compan*.

¹⁶⁴ WAITE, M. (eds.) (2004).

To extend the search it is advisable to use truncations like “*”, “?” or “”. Searching the term climat* generates results for climate and / or climatic change. The truncation “?” replaces a consonant. This is useful for words with different writings resulting from British and American English e.g., organization and organisation. The last truncation (“”) searches for an exact phrase or a combination of words e.g., “global warming” will generate results discussing global warming. Otherwise the search engine would generate results for global and / or warming. Furthermore the search was limited to the abstract, title, keywords and subject terms at the beginning.

To find papers which are only discussing adaptive capacity, adaptation was at first excluded by adding NOT adaptation to the above search combinations.¹⁶⁵ In fact, it is not recommendable. After identifying the search term combinations a cross-check was done to prove their validity and, if necessary, an adjustment was conducted. This short cross-check showed that more results can be found if this exclusion was not made. This follows the fact that adaptive capacity is closely related to adaptation and that adaptive capacity is discussed in the context of adaptation, not separately. We remember that adaptive capacity is antecedent to adaptation which is a manifestation of adaptive capacity. As a result, the search was extended by text search which supports the search of search term combinations within the text. In this way, studies are identified, which were discussing adaptive capacity within the text, but did not mention the term within its title, keyword, subject or abstract.¹⁶⁶

After considering that conducted results were often policy-related or with a natural science focus the search was broadened by the search term combinations “adaptive AND skill* OR competenc*OR capab* OR resource* OR abilit* AND "climat* change" OR global change OR environment* change OR "global warming" OR "extreme weather events" AND compan* OR business OR enterprise* OR organi?ation* OR management OR firm* OR corporat* OR sector OR industry AND strategy”. This combination is based on the findings in chapter 2.1.2. that there are different terms used for adaptive capacity. It was further enlarged by searching for “adaptive capacity AND construction OR manufacturing OR strategic management” and e.g., “corporate AND response AND climate change AND strategy”.

Searching within preliminary sources

The possibilities of where to search for relevant literature is enormous. The objective of a systematic review is to find all literature on a specific topic and synthesise them.¹⁶⁷ Within the frame of this work the sources searched were limited to three databases. Based on the search terms an in-depth search was done in the following databases: Academic Search Complete¹⁶⁸, Business Source Complete¹⁶⁹, both provided by EBSCOhost^{®170} and ISI Web of knowledge^{SM,171} provided by Thomson Reuters¹⁷². EBSCOhost[®] itself states that it is the most-used,

¹⁶⁵ This followed the assumption that the paper is not discussing adaptation to climate change but adaptive capacity.

¹⁶⁶ Searching for adaptive capacity in the title, keyword or abstract will result in a limited number of studies. If there would be a high amount of studies the aim would be to limit the search results. Considering the fact that adaptation research and adaptive capacity research is a relatively young research topic, it is important to find literature discussing adaptive capacity and business, which means to broaden the literature search by searching within the text (TX).

¹⁶⁷ See GÜNTHER; E.; HOPPE, H. (eds.) (n.d.), p. 4.

¹⁶⁸ ACADEMIC SEARCH™ COMPLETE, <http://www.ebscohost.com/academic/academic-search-complete/> ©2011.

¹⁶⁹ BUSINESS SOURCE® COMPLETE, <http://www.ebscohost.com/academic/business-source-complete/> ©2011.

¹⁷⁰ See EBSCOhost® (eds.), <http://www.ebscohost.com/> © 2011.

¹⁷¹ THOMSON REUTERS (eds.), <http://www.isiwebofknowledge.com/> © 2011.

premium online information resource for tens of thousands of institutions worldwide and is representing millions of end-users.^{173,174} Web of knowledge is s today's premier research platform for information in the sciences, social sciences, arts, and humanities.¹⁷⁵ Furthermore, it has been searched within WebOPAC¹⁷⁶ for literature on theoretical background.

In addition, the search was accomplished by an ancestry approach¹⁷⁷ which included the search within the reference list found at the end of journal articles or books.¹⁷⁸ Since there were articles which were not found in databases, Google Scholar^{TM,179} was used to get the full text. In addition, the 6 top Journals Academy of Management Review, Academy of Management Journal, Strategic Management Journal, Havard Business Review, Management Science and Long Range Planning were searched also.

As stated in above a search within the text was done. This means that the search also conducted paper which mention the term adaptive capacity or strategy but did not explain the term or examined the term further. Therefore, the abstract was read and the document was opened and searched for the three core issues. The following Table 6 shows conducted results for a few search term combinations. A full overview of conducted search results per database is provided in Table 14 Appendix A.2.

Table 6: Illustration of conducted search results in EBSCO

search terms	database	EBSCO							
		ASC				BSC			
		results	redundant	new	relevant	results	redundant	new	relevant
"adaptive capacity" AND climat* 1 change AND strategy AND compan*		121	36	85	27	51	2	49	25
"adaptive capacity" AND climat* 2 change AND strategy AND business		164	99	65	19	103	44	59	13
"adaptive capacity" AND climat* 3 change AND strategy AND enterprise*		74	61	13	1	58	54	4	1
"adaptive capacity" AND climat* 4 change AND strategy AND organization*		266	183	83	24	108	80	28	8
"adaptive capacity" AND climat* 5 change AND strategy AND management		349	294	55	9	145	134	11	4
"adaptive capacity" AND climat* 6 change AND strategy AND firm*		90	89	1	0	45	45	0	0

¹⁷² WEB OF KNOWLEDGE, <http://www.isiwebofknowledge.com/> © 2011.

¹⁷³ See EBSCOhost[®] Publishing (eds.) (2011), <http://www.ebscohost.com>, w/o page.

¹⁷⁴ Searching within the databases TOC Premier, EconLit and Risk Management Reference Center was stopped after considering 20 search terms since they did not provide new relevant search results.

¹⁷⁵ See THOMSON REUTERS (eds.) (2011), <http://www.isiwebofknowledge.com>, w/o page.

¹⁷⁶ SÄCHSISCHE LANDES-, STAATS- UND UNIVERSITÄTSBIBLIOTHEK DRESDEN (SLUB), www.slub-dresden.de © 2011.

¹⁷⁷ This term was coined by COOPER, H. (1989), p. 43 cited in MERTENS, D. M. (2005), p. 95.

¹⁷⁸ See MERTENS, D. M. (2005), p. 95.

¹⁷⁹ GOOGLETM Scholar Beta, <http://scholar.google.com/> © 2011.

search terms	database	EBSCO							
		ASC				BSC			
		results	redundant	new	relevant	results	redundant	new	relevant
"adaptive capacity" AND climat* 7 change AND strategy AND corporat*		74	73	1	0	34	34	0	0
8 "adaptive capacity" AND climat* change AND strategy AND sector		255	250	5	2	130	128	2	2
9 "adaptive capacity" AND climat* change AND strategy AND industry		193	189	4	1	110	110	0	0

(Own illustration.)

In the left column are search term combinations and in the right column the overall results, thereof redundant results and new results. The column “relevant” was complemented after deciding whether a paper was included in further analysis or not, which will be explained in detail in the next chapter.

The latest update of this search has been conducted in March 2011.

3.3 Evaluating the search results

The previous chapter explained the approach for searching the literature. The next important step is to decide whether these results are relevant and included in further analysis or if they were excluded. This chapter explains the underlying criteria for this decision. I conducted a data extraction sheet, composed of three parts, which is presented below. As mentioned in chapter 3.1 it has to be decided on criteria for exclusion of studies for limiting search results to relevant papers.

In the **first step**, the literature was scanned again based on the questions as seen in Table 7. This means that conducted search results were integrated in further analysis if they fulfilled one of these requirements. Collected studies which did not fulfil these criteria were excluded.

The following table presents the criteria used to decide whether a paper was included or not.

Table 7: Criteria for screening and inclusion of studies

Criteria for inclusion of studies	
Adaptive Capacity	Is Adaptive Capacity or a similar term defined and discussed within the paper?
Strategy Development	Does the paper discuss strategy / strategy development or decision-making process (with regard to AC)?
Climate Change Strategy	Does the author explicitly discuss climate change strategy (with regard to AC)?

(Own illustration.)

With regard to the research topic the literature must include a definition of adaptive capacity or a term which has a similar meaning e.g., response, adaptation capacity or adaptive capabilities. More importantly the literature should review adaptive capacity with regard to strategic issues e.g., development, formulation or decision-making and climate change at best.

In the **second step**, if the literature were considered as relevant for further analysis, the following data were extracted. The data is used to give a rough description of the literature. It basically includes biographical details on author and co-authors, title, year of publication, type of article, initiated by, the Journal and Volume as well as issue. Table 8 gives an overview about the mentioned attributes (left column) and its features.

Table 8: Data extraction sheet - Part I

Data extraction sheet – Part I	
Name	Name of the lead author – resp. author first stated in the paper
first Name	Lead author’s first name, middle name
Title	Title of paper, book, etc.
Year	Year of publication NOT year of submission
Co-Authors	Name, First name; Name, First name; etc.
Type of Article	Book Chapter, Working Paper, Research Paper, Theoretical Paper
Published by	Elsevier, Wiley, etc.
Initiated by	Who commissioned the study? (University, Research Centre, ...)
Ref.-ID	Refworks-ID
Ref.-type	Refworks-type
Journal	Full name of Journal
Volume	
Issue	
Pages	

(Source: GÜNTHER, E.; HOPPE, H. (eds.) (n.d.), p. 5.)

With the **third step** information about the origin of the study (based on origin of lead author), the author’s discipline and the origin of investigation (academic vs. non-academic) were collected as presented in Table 9. Information on the level of examination includes whether adaptive capacity is discussed on a national, regional, individual or business level.¹⁸⁰ This was used later on for further limitation of search results. Furthermore, the attributes ranking (if it is a Journal), source and search term were included.

Table 9: Data extraction sheet - Part II

Data extraction sheet – Part II	
Level of examination	What is the level of examination? (Industry, Organization, Community, Region, ...)
Country of origin	Origin of Study by first author
Subject	What is the Subject of Study?
Industry Sector	Classification according to European Industry Classification Standard (NACE)
Country	Is the study bound to a special country? e.g., Case Study on industry in UK
Continent	Specification of Continent
Ranking	If it is a Journal, then include Ranking
ISI-Factor	

¹⁸⁰ The national, regional and individual level has been included in case that adaptive capacity has not been discussed on a business level so far. From the beginning it was apparent that adaptive capacity is a relatively young research topic in the strategic management literature.

Data extraction sheet – Part II**VHB JQ 2****Handelsblatt**

Source	BSC, ASC, ISI Web of Science, Journal, Search within reference list
Search term	Which search term conducted the paper?

(Own illustration.)

The evaluation sheet presented in this chapter is the basis for the selection and analysis of the relevant literature. The data, generated by the data evaluation sheet will be used for a quantitative analysis. The information collected within the data extraction sheet gives a first impression of the relevant literature. Results will be given in chapter 4.1.

3.4 Developing a coding schedule to analyse studies

In the last chapter we developed a data evaluation sheet for a quantitative analysis of the existing literature. This allows us to generally describe the literature. Now we need to think of a way to qualitatively examine the references¹⁸¹ and to synthesize them. As COOPER states the first rule in constructing a synthesis coding sheet is that any information that might have the remotest possibility of being considered relevant should be retrieved from the studies.¹⁸² The question is what would be the appropriate method for this? A common method within the scientific research is the qualitative content analysis.¹⁸³

Qualitative content analysis

I only give a brief theoretical overview about the method applied within this work. As it supports the systematic review we will not go into detail about that method.¹⁸⁴ Qualitative content analysis has become more and more important in the last years either for examining newspaper article, newscasts or interviews.¹⁸⁵ The term content analysis is mainly used in empirical social sciences. Within this work I refer to the qualitative content analysis of MAYRING.^{186,187} MAYRING states that there are three types of techniques: Summary, Explication and Structuring.¹⁸⁸

As the other techniques are not detailed enough they do not apply for this work.¹⁸⁹ I concentrate on the technique of structuring.¹⁹⁰ This technique aims at structuring observed material.

¹⁸¹ Within this context we will use the word references to differentiate between conducted literature and the actually exploited and analysed literature.

¹⁸² COOPER, H. (1998), p. 27.

¹⁸³ There is also the Grounded Theory or global evaluation theory. Both do not apply within this context and will not be discussed in this work. See BORTZ, J. & DÖRING, N. (2006), p. 331ff. for further information.

¹⁸⁴ The qualitative content analysis is a method itself. We will use it as support for the evaluation of search results. For detailed information see relevant authors within the empirical social research such as MAYRING, P. (2002), p. 114ff. See also ATTESLANDER, P. (2006); BORTZ, J. & DÖRING, N. (2006); DIEKMANN, A. (2007) et al.

¹⁸⁵ See ATTESLANDER, P. (2006), S. 181.

¹⁸⁶ See MAYRING, P. (2002), p. 114ff.

¹⁸⁷ MAYRING is one of the most important authors in this field and is often being cited by other authors. For example DIEKMANN, A. (2007); ATTESLANDER, P. (2006) and BORTZ, J. & DÖRING, N. (2006).

¹⁸⁸ See MAYRING, P. (2002), p. 114ff.

¹⁸⁹ The method of summarising does not apply as it aims at summing up and reducing the content to one main result. The method of explication does not apply as the scope does not fit to the scope of this work and exhibits a more interpretive character. See MAYRING, P. (2002), p. 117f.

¹⁹⁰ For information on the other techniques see MAYRING, P. (2002), p. 114ff.

This could be content-related aspects, scale or the assessment of previously defined dimensions.¹⁹¹ It classifies parts of the text to the corresponding defined categories.¹⁹² These categories are built in three steps:

1. Definition of categories: Find a category where relevant information can be assigned.
2. Example: Define an example which explains which information should be covered within the category.
3. Rules for coding the material: In case an explicit assignment is not possible, there need to be rules which enable this assignment as clearly as possible.¹⁹³

How can this be applied for this context? The coding sheet for the evaluation has to be organized in a way to structure the material in a way to extract the relevant information which are significant for synthesizing the literature.

The Coding Sheet

The a priori developed coding sheet consists of a category system which was developed based on the steps mentioned above. First, I specified the main categories the material will be divided into. Secondly, I defined examples for possible text parts including the relevant information. These examples are formulated as questions. Table 10 shows the applied coding sheet. Obviously, the main categories reflect the main research question which consists of the two core issues „adaptive capacity“ and “strategy”. Around these two core issues the coding sheet was built and composed of 4 parts.

In the **first part** general information on type of study (including method), author’s research discipline and aim of article are collected. Those information are important for understanding what the study initiated and what relationship basically is investigated.

Table 10: Coding sheet

Coding sheet	
Type of study	Theoretical Paper, Research Paper
Aim of article	What is the background of the article?
Research Discipline	Research discipline by first author e.g., Management, Organisation studies, HRM, etc.
Adaptive capacity	
Definition	Does the author define the term AC?
Thesaurus	Does the author use different words which are describing the same matter? e.g., response, adaptation capacity, adaptation capabilities) OR Does the study state adaptation with different approaches, e.g. organizational learning, capabilities, change management, risk management, vulnerability, resilience, etc.?
Characteristics	Does the author mention features / characteristics of adaptive capacity? What influences AC? OR Does the author mention features / characteristic of different concepts / approaches as coded within Thesaurus?
Adaptation	What is adaptation? What is the difference to adaptive capacity? Which role plays adaptation within the paper? How is it related to AC or similar approaches / concepts?

¹⁹¹ See MAYRING, P. (2002), p. 118 ff.

¹⁹² See MAYRING, P. (2002), S. 118.

¹⁹³ See MAYRING, P. (2002), S. 118 f.

Strategy	
Strategy development	Does the paper give an example about how AC can be used for strategic matters / issues?
Climate change strategy	Does the author defines CCS – respectively – does the author link AC to CCS?
Decision-making	Does the paper discuss AC as a variable for decision-making?
Business Relevance	What is the relevance of AC or similar concept for business? Why should companies even think about the issue?
Miscellaneous	
Results	What is the papers core statement? What are the results the study generated?
Criticism / Limits	Does the author state criticism / limits to its own assumptions and results?
Other important facts	Include all aspects which cannot be assigned to one of the other categories but is assessed as important
Further research investigations	Are there any needs for future research stated by the author? Does the study identify needs for further research?

(Own illustration.)

Within the **second part** all information on AC are collected. Relevant parts about *definition* of AC and their connection to other concepts were coded. Possible connections can either be AC is linked to other concepts or it is expressed by those other concepts. This was coded in the category *Thesaurus*. The category *Characteristics* includes all information on factors or determinants which drive AC or the other concept expressing AC.

The **third part** of the coding sheet focuses on strategy. Thereby strategy is divided in strategy development, CCS, decision-making and business relevance. Within the category *strategy development* general information on strategy, drivers influencing strategy formulation or strategic change were included. All parts providing information on climate change and strategy are assigned to the category *Climate Change Strategy*. I distinguished between general information on strategy and CCS based on the assumption I explained in Chapter 2 which included that paper might discuss strategy but not CCS. The category *decision-making* was included for all remaining information on decision processes. One may say that decision-making is distinctive to strategy but insights on drivers of decision-making processes can provide interesting findings for the strategy process. I also argue that the strategic process is a decision-making process in a broad sense. The category *business relevance* contains information on the necessity for business to think about AC or other concepts.

The **last part** of the coding sheet includes information on core *results* of the study, *criticism or limitations* to these results, *future research investigations*. All remaining information which could not be assigned to one of the above mentioned categories but were still considered as important were coded within the category *other important facts*.

Summing up what we did within this chapter: I explored the methodological approach for this work. **At first** I defined the term systematic review, explained the advantages of this type of review and how it is executed. **Then** I concentrated on planning a literature search, established a search strategy and decided on the preliminary sources searched. **This was followed** by the development of a data extraction sheet which enables us to limit search results and sub-

sequently do a quantitative analysis. **Finally**, I introduced the way of analysing the references on a qualitative basis, preparing for the synthesis of the references which will be done below.

4 Results

The last chapter 3 explained the underlying approach to generate, evaluate and analyse the literature. Within this chapter I analyse the conducted literature, in the following referred to as references. This empirical analysis is divided into 3 steps. First, the references are examined on a descriptive basis by using absolute and relative frequency (Chapter 4.1). The description of samples is based on the categories I defined in the data extraction and coding sheet.¹⁹⁴ Then I continue with clustering the reference pool by the author's background, the impact of the studies for my research questions and finally by the underlying theoretical concepts (Chapter 4.2). This is completed by a qualitative synthesise and a reflection on research questions.

The search yielded 5772 results. Table 13 Appendix A. 3 shows the process for limiting and selecting relevant paper. By eliminating redundant results the literature was reduced to 671 results. These results were limited by excluding results which did not match the criteria¹⁹⁵ and results which were not available.¹⁹⁶ Consequently, the results were limited to 194. As described in Chapter 3 the search was enhanced by searching in Journals and the reference lists of the search results hence 33 papers were added. As a result, 227 relevant results were conducted. This was narrowed down further by excluding all studies which discussed adaptive capacity on a governmental level¹⁹⁷. Only studies referring to the organizational or industrial level were examined further. Additionally, all references investigating the following industries were excluded: agriculture & forestry, fishing and public administration. This exclusion was done since public administration is strongly related to the policy level. The industries: agriculture, fishing and forestry were also excluded since these are non-commercial industries and thus experience different market conditions and regulations e.g., subsidisation.¹⁹⁸ Overall, the number of research results are limited to 60 paper, in the following described by the term references.

4.1 Description of samples

Within this chapter the 60 references are analysed on a quantitative basis which includes frequency and descriptive statistics. To get an overview about the reference pool I analyse the references by year of publication, origin (geographical and research background), industry sector and quality. Beforehand, it is necessary to view the search term combinations which yielded the most results. Almost one-third of the references were conducted by the tenth search term combination "adaptive capacity" AND environment* change AND strategy AND company. Another one-third of the references were conducted by search within their reference list and Journals. The remaining one-third was conducted by different search term combinations. Thereof, seven references were found by the search term "adaptive capacity" AND cli-

¹⁹⁴ See Chapter 3.3 and Chapter 3.4.

¹⁹⁵ See Chapter 3.3 for explanation of developed exclusion criteria.

¹⁹⁶ This applied for eight search results. Thereof, two results might be of interest: SLOCUM JR., J. et al. (1994): Survival of the smartest and PARK, J. (2008): Strategy, Climate Change, and the Japanese Firm: Rethinking the Global Competitive Landscape of a Warming Planet.

¹⁹⁷ This included all paper which were examining the regional, national, community or individual level.

¹⁹⁸ It should be noted here, that almost 20 % of the eliminated search results were examining the Agriculture & Forestry and Fishing industry. Moreover, almost 40 % were related to Public Administration. This shows that relatively strong research was already conducted in this field and strengthens the statements in Chapter 2.1.2 where I pointed out that the term adaptive capacity has strong impact in the disaster, vulnerability and resilience research which relates to policy and governmental decisions especially in highly climate change affected countries.

mat* change AND strategy AND company* which is, referring to the research question, the term which was assumed to find the most fitting paper. Why is this fact important? It leads me to two important expectations, which should be kept in mind for the analysis below:

First, it becomes apparent that the papers do not focus on climate change in particular. The scope is thus broadened to environmental change which can also be technological change and change in market conditions e.g., consumer behaviour or regulations. This means that adaptive capacity (hereafter abbreviated with AC) in combination with climate change, strategy and company lacks of research.

Secondly, it might be expected that with regard to the question of this study, whether AC is antecedent to Climate Change Strategy (hereafter abbreviated with CCS), a concluding answer might be challenging.

Year of Publication

Besides one document which was published in the 1980s, the majority of the references were published after 1990 as shown in Figure 5. About one-fourth of all references were published before 2000 and three-fourth were published during the last decade. The trend line exhibits that the publication of papers is steadily increasing. This emphasizes the presence of the issue and the actuality of the debate about adapting to changing environments and thus growing interest within scientific research.

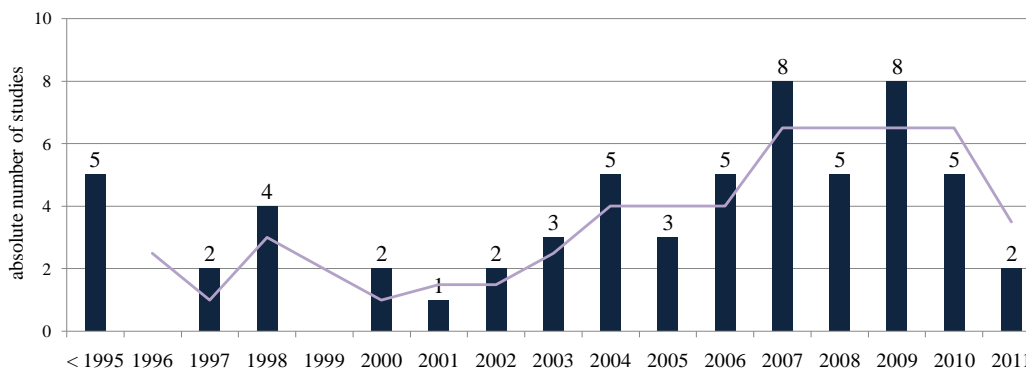


Figure 5: Absolute number by year of publication
(Own illustration.)

Geographical Origin

The classification is based on the first author of the study and his background. This means that the assignment to a continent is related to the geographical origin of the first author. As we can see in Figure 6, ten references were originated outside Europe and North America. Only one study cannot be assigned to its geographical origin.¹⁹⁹ The majority of the references were originated in Europe and North America.

¹⁹⁹ This is because the reference HOFFMAN, A. (2007) is a Chapter within a book. Note: n.A. stands for not available.

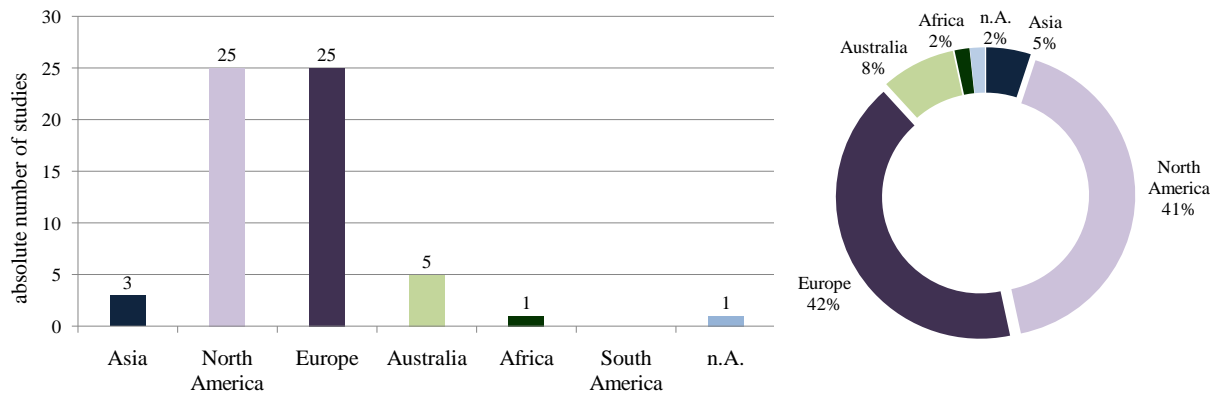


Figure 6: Absolute and relative distribution by geographical origin
(Own illustration.)

To some extent, this domination can be explained by the focus on English literature.²⁰⁰ Still, this classification does not provide a reasonable finding since the origin of a study can be biased through the increasing international cooperation of universities and research institutes.²⁰¹

Research Background

The references were either initiated by authors from Universities, Research Centres, Research Institutes or companies. If the reference was initiated by a company it was classified as non-academic. By contrast, the references were classified with academic if they were initiated by a University, Research Centre or Research Institute.²⁰² Based on this, as shown in Figure 7, it can be stated that the vast majority of references were academically initiated (93%). Only 4 references derive from a non-academic background.²⁰³

Type of Article

Another classification of papers is provided by their type of article. Hereby, the references were categorized into Research Paper, Theoretical Paper and Book Chapter. This was initiated to examine whether the references are more conceptual or empirical. For some references the author did not state which method was applied. Resulting from that, these characteristics were assessed after reading the references. The reference was assessed as a theoretical paper if there was just a small or no empirical part e.g., Case Study, Interview or Survey.²⁰⁴ If an em-

²⁰⁰ In Chapter 3.2 I explained why I focused on English literature. The reason is the relatively new research attention to this topic, which assumes that literature is published in English to gain more international attention.

²⁰¹ The reason for this fact is the assignment by the first author. If there is a cooperation of 2 or more countries it is not documented in this graph. This applies e.g. for AUDIA, P. G.; LOCKE, E. A.; SMITH, K. G. (2000), CHAPIN, F. S. et al. (2010), GULATI, A.; LAWRENCE, P. R.; PURANAM, P. (2005), KORHONEN, J.; SEAGER, T. P. (2008) and LEVY, D. L.; KOLK, A. (2002).

²⁰² Again, it should be mentioned that the classification is based on the first author of the study.

²⁰³ This applies for BUONO, A. F.; KERBER, K. W. (2010), DUGAL, M.; GOPALAKRISHNAN, S. (2000), GLOR, E. D. (2007) and SUSSMAN, C. (2004).

²⁰⁴ The reference BUONO, A. F.; KERBER, K. W. (2010) was assessed as theoretical paper even though it included a Case Study. The focus of this paper was strongly theoretical and the empirical part was very small in relation to the theoretical part. KLARNER, P.; PROBST, G.; SOPARNOT, R. (2007) as Working Paper is included in here as well.

pirical part existed, the paper was assessed as a research paper.²⁰⁵ Only two references are chapters from a Book. Figure 7 shows the relative distribution of references by type of article. Overall, the majority of references are empirically focused. This can provide interesting insights on current company behaviour.

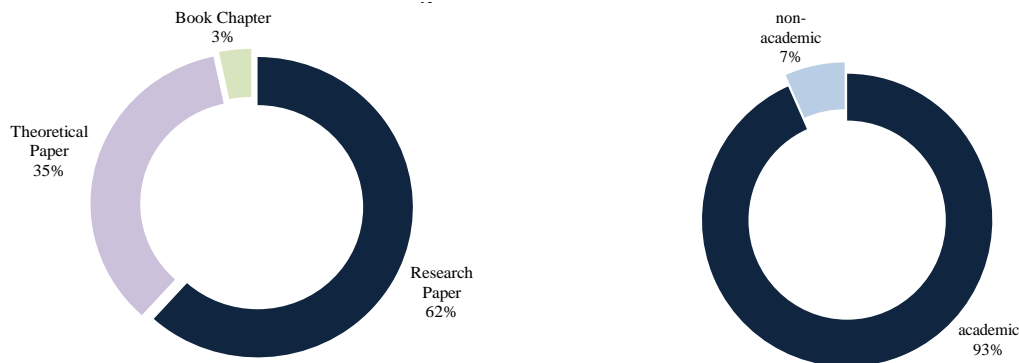


Figure 7: Relative distribution by type of article and research background
(Own illustration.)

Quality

If the reference was published within a journal, which is the case with 93 % of the references, information on Journal rankings were documented. This includes the ISI-Impact Factor 2009²⁰⁶, the VHB Jourqual²⁰⁷ ranking and the Handelsblatt²⁰⁸ ranking.

What applies for all of these rankings is that the higher the value the better is the quality of the Journal. I will use the ISI-Impact Factor to evaluate and compare this with the VHB Jourqual and Handelsblatt ranking. Thereby the box whisker plot as shown in Figure 8 provides an overview about the evaluation of the reference pool by showing the minimum, maximum value, the lowest quartile, median and the upper quartile. This box plot includes all references where information on the Journal ranking was provided.²⁰⁹ As you can see at the ISI-Impact Factor box plot, the majority of references range from 1.259 to 3.635. The Median is 1.704. The median tells us the value where the half of the references is scored above or below this value. This seems to be a comparatively low level conferred to the highest given value and

²⁰⁵ The references BERKHOUT, F.; HERTIN, J.; NIGEL, A. (2004), DUNN, S. (2002) and KORHONEN, J.; SEAGER, T. P. (2008) were different to the usual type of article but were empirical in nature that is why they are added to the category research paper.

²⁰⁶ The ISI-Impact-Factor is provided by THOMSON REUTERS and is a ratio between citations and recent citable items published. The Impact-Factor is calculated by dividing the number of current year citations to the source items published in that journal during the previous year. For more information see THOMSON REUTERS, http://thomsonreuters.com/products_services/science/free/essays/impact_factor/, w/o page, requested: 04/25/2011, 8:30pm.

²⁰⁷ The VHB Jourqual Ranking evaluates the scientific quality of Journals relevant for Business and Management scientists. The Journal articles were assessed by over 1000 scientists within an online-survey. For more information on applied method see VERBAND DER HOCHSCHULLEHRER FÜR BETRIEBSWIRTSCHAFT E.V. (eds.), <http://vhbonline.org/service/jourqual>, © 2009.

²⁰⁸ The Handelsblatt ranking is based on conventional scientific standards for evaluating scientific research such as the Jourqual ranking and the ISI-Impact Factor. The Handelsblatt ranking assesses a Journal by scientific compliance and how difficult it is to publish a paper within this Journal. The focus of the Handelsblatt ranking is business and management. For more information see HANDELSBLATT GMBH, <http://handelsblatt.com/politik/bwl-ranking/methodik-und-interpretation/3180850.html>, w/o page, requested 04/24/2011, 8:44pm.

²⁰⁹ The calculated values for the Median and the 1st and 3rd Quartile only includes the references where a Journal ranking was available. The ISI-Impact Factor / Handelsblatt Ranking / VHB Jourqual were not available for 23 / 27 / 24 references.

leads to the assumption that the references were published in Journals with low assessed quality. In fact, it is not possible to draw this conclusion since only one paper was assessed with 11.564.

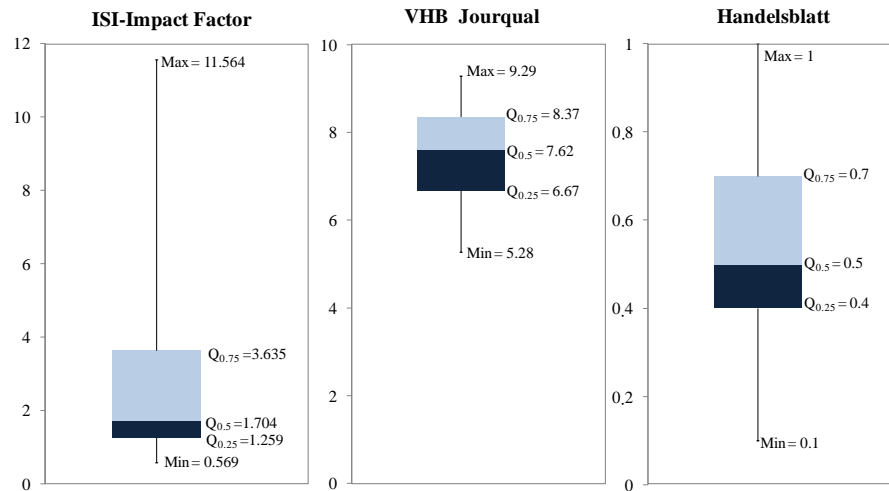


Figure 8: Box whisker plot for quality of references by Journal rankings

(Own illustration.)

It still seems to be the case that the Journals where the references are published have low quality performance. The ISI-Impact Factor is an indicator for the scientific impact represented by citations thus the quality refers to the impact the Journals have on other Journal article. On the contrary, the quality of references seems to be high when taking into account the Handelsblatt and the VHB Jourqual ranking. Appendix A. 4 shows that Journals were assessed similar between rankings. This means Journals which were assessed with a high value within the ISI-Impact Factor were also assessed in the upper Quartile within the other Rankings. Nevertheless, there are some exceptions. The Journal “Management Science”, “Organizations Studies”, “Human Resource Management”, the “International Journal of Human Resource Development” and the “British Journal of Management” achieved a higher value in the Handelsblatt and VHB Ranking. A possible explanation is the focus of these 2 Rankings on Business and Management Journals whereas the ISI-Impact Factor does not focus on a special research field. Nevertheless, it can be stated that, relatively speaking, within the Handelsblatt Ranking and the Jourqual ranking the Journals are assessed better. All in all, one should be careful with a concluding remark about the quality of the references. These findings can be used for excluding references which score below a certain value e.g., the 1st Quartile at most. Considering the VHB Jourqual Ranking which is addressed from and to Business Scientists the references are ranked within the top third.

Industry Sector

The references can be classified by breaking them down into two groups: industry affiliation and no industry affiliation. About 13 references are not affiliated to an industry and further 16 references have no special industry focus.²¹⁰ Still, as shown in Figure 9, the majority of stud-

²¹⁰ The references with no industry focus can partly be explained by their nature which means that they are more theoretical and conceptual in nature.

ies exhibit a link to an industry. References which study a special industry are classified by industry sector. Thereby, the classification is based on the Statistical Classification of Economic Activities in the European Community (NACE).²¹¹

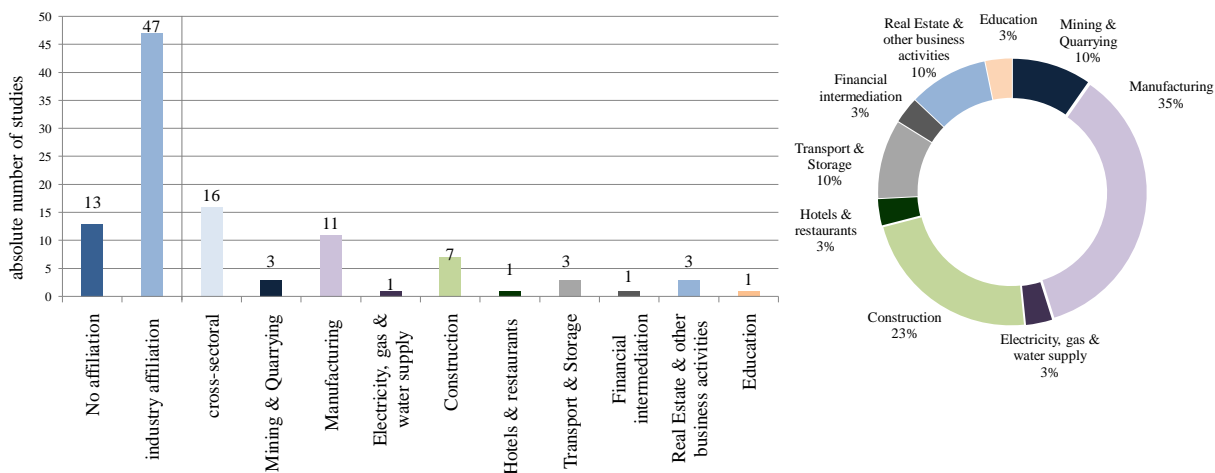


Figure 9: Absolute and relative distribution by industry sector
(Own illustration.)

As expected, Manufacturing and Construction are strongly represented compared to other industries. The industry sectors of Mining & Quarrying, Transport & Storage and Real Estate & other business activities which are well represented while the remaining industries are only represented with one reference. This can be explained by the fact, that Manufacturing and Construction are directly influenced by changing environments through technological, market and climate change. However, it is surprising that Mining & Quarrying as well as Transport & Storage are not represented more frequently since these industries face regulations or changes which influence their business directly.

Subject of Reference

By limiting the paper based step-by-step based on exclusion criteria the majority of the references are linked to the Business & Management context. This classification was either provided by the databases or was done after reading the Abstract. Thereby I differentiated between Management, Business, Strategy, Organizational Studies, Environmental Studies, Strategy, Social Sciences, Human Resource Management (in the following abbreviated with HRM), Technology & Engineering and Natural Sciences. Here should be noted, that subjects are not necessarily disjunctive and references can be assigned to two subjects or even more.²¹² The following Figure 10 presents the absolute number of studies by Subjects.

²¹¹ As explained earlier within this chapter all industries referred to public administration and services as well as agriculture, forestry and fishing were excluded from further examination.

²¹² For example BEERMAN, M. (2011) is assigned to Business, Management and Organization. See Appendix A. 7.

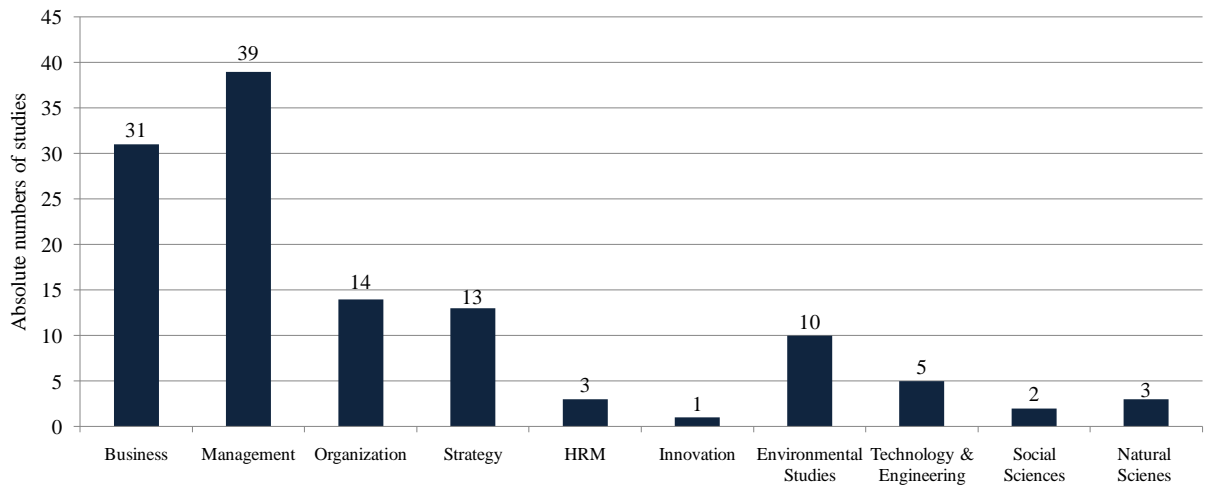


Figure 10: Absolute numbers by subject

(Own illustration.)

The Subjects of the references are diverse. Even though they come from a Business background, the papers observe different research field within the business context such as Organization theory, Strategy, HRM, Innovation, Environmental Studies and even Technology & Engineering or Natural Science. This provides an important fact for the next chapter. As the papers analyse different subjects it leads to the assumption that findings will be heterogeneous. Furthermore, depending on the subject of the paper, the view on AC and its relationship to CCS varies strongly. This fact was the basis for potential approaches applying for synthesising the references. These approaches are discussed within the next chapter 4.2.

In short, it can be stated that the majority of references were published after 2000. By continent, about 80 % of the studies can be assigned to North America and Europe. The reference pool is, with a ratio of 40 % theoretical to 60 % empirical papers and to 93% initiated by Research Institutes or Universities, highly academic. By Industry, almost 80% of the papers show an industry observation while almost 30 % exhibit observations across different sectors. Furthermore, 20 % are not affiliated to an industry sector. Strongly represented industries are Manufacturing and Construction (50 % of explicitly industry affiliated studies). With regard to the quality of the paper, 40% of the references cannot be assessed. By Handelsblatt and VHB Ranking the references are ranked in the top third or mid-third whereas references within the ISI-Impact Factor 2009 lie within the lower third. It can be argued whether it is advisable to further limit the references by excluding papers which are ranked within the 1st quartile to ensure the quality of the references. It would also be possible to only look at the references published within the last 10 years. By fact, these exclusions are not yet done since the number of acceptable studies is not large enough to substantiate a general conclusion. This is why I follow the assumption of COOPER “let the data speak”.²¹³ The only exclusion of studies is based on the a priori defined exclusion criteria in Chapter 3.3.²¹⁴ Taking these facts into account it can be stated that the reference pool is not balanced and heterogeneous.

²¹³ COOPER, H. (1998), p.84.

²¹⁴ See COOPER, H. (1998), p. 84. He revives the discussion of a priori exclusion of conducted search result by such criteria. He states that the only appropriate exclusion of references is when the criteria for it are defined upfront.

4.2 Qualitative analysis and systematisation of findings

Within this Chapter I examine methods for the systematisation of references. There are a couple of methods which could be used for systemising the references in a way which allows a conclusion about common scientific sense on Adaptive Capacity and Climate Change Strategy. One potential method might be the classification of references in groups which are as homogenous as possible followed by the analysis of these groups' findings on AC and its relationship to CCS. This aggregation can be based on the characteristics described within Chapter 4.1 which is the classification by Year of Publication, Industry Sector, Applied method or Subject. However, this method is not applicable within the context of this work as it shows one disadvantage. This way of systematisation underlies the assumption that similar findings on this issue are a) given within this groups and b) a concluding answer regarding the main research question can be derived. As I already pointed out in the last chapter, the references are too heterogeneous as they could be clustered in this way. We already know that AC is settled within different research backgrounds. Therefore it is interesting to look at different research fields of authors. After that I analyse the references by assessing their impact for the underlying research question. Finally, I will analyse the references by different underlying theoretical concepts.

4.2.1 Author's discipline

In the last chapter it was pointed out that the references are settled in different research areas. In chapter 2.1 I discussed 2 views on Adaptive capacity within the business context which were basically settled in organisational studies. In the following we see whether AC is also settled within strategic management literature or other research areas. As I examined by Subject the reference in general address different research areas. To complement this I will analyse which research background the authors of the references have. This will give us an idea in which research areas the concepts and findings will be settled and what might influence the view and definition of adaptive capacity.

Overall, 50 authors exhibit a business or management background. These 50 references are subdivided as shown in Figure 11. One-quarter (25 %) of the authors are from a strategic management background.²¹⁵

²¹⁵ The percentage is given according to the amount of studies within the overall background. (i.e. business or non-business background).

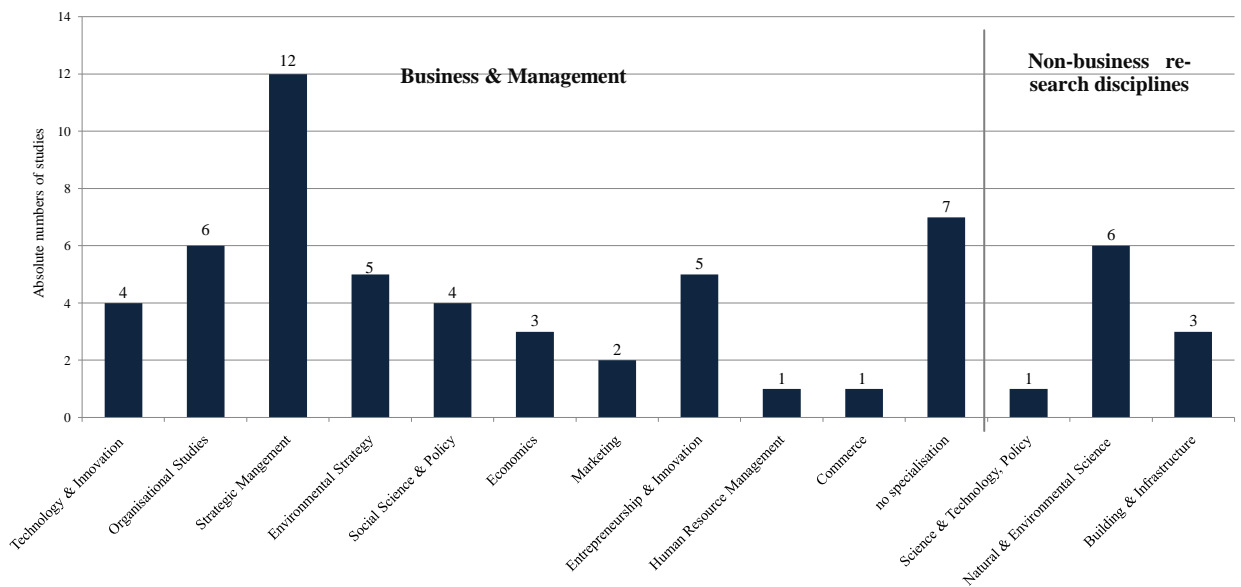


Figure 11: Absolute number of studies by author's research discipline
(Own illustration.)

The subfield Environmental Strategy is exhibited separately but can be added to the number of authors from a strategic management background, thus resulting to over 30%. Moreover, the research disciplines Entrepreneurship & Innovation and Organisational studies are more often represented with a percentage of 10%. These are closely followed by the disciplines Technology & Innovation and Social Science & Policy with 4 studies each (8%). The disciplines economics, marketing, HRM and Commerce are only represented with 1-3 studies each. Within the non-business research disciplines natural & environmental science is represented with 6 studies, closely followed by Building & Infrastructure. Science & Technology Policy is only represented with one study.

This shows again the heterogeneity of references and that the paper might examine different concepts and might have different underlying assumptions for their work as they come from different research fields with different problems and scientific research questions. Analysing the references briefly this is confirmed fast. This way of clustering the paper does not lead to the result this work aims at. Therefore, a different way of examining the references with regard to a holistic understanding of AC and CCS needs to be developed. This is taken into account within the next two chapters 4.2.2 and 4.2.3.

4.2.2 Synthesis by impact of references

Within this chapter I analyse the papers by ranking them based on their relevance regarding the main research question. This classification of papers is thereby based on an ABC-Analysis. The ABC analysis is a simple, qualitative and comparative instrument for distinguishing important activities, processes, etc. from unimportant ones.²¹⁶ Transferred to this context the references are distinguished by their significance for answering the main research questions which means whether the reference has a high impact for this work or a low impact. Therefore the references are classified as A (high impact), B (high-medium impact), C (medium-low impact) and D (low impact) paper. Components which have to be contained for being an A or B, C, D reference are illustrated in Table 11. These components are based on the criteria I developed within the coding sheet in chapter 3.4.

Table 11: Assessment of references by impact

	AC is mentioned within the study	AC is defined within the paper	A similar term is discussed	The study refers to strategy	The study refers to CCS	Study refers to decision-making	#
A	x	x	O	x	x	O	6
B	x	O	x	x	x	O	3
C	x	O	x	(x)	-	(x)	16
D	O	O	O	O	O	O	35
x Information on this issue is required				O Information can be provided but is not required			
- Information is not provided				(x) Information on at least one or the other is required, both are possible			

(Own illustration.)

To be ranked as an **A reference** the paper need to fulfil the following criteria:

- a) the paper *mentions* the term adaptive capacity (AC) and *provides a definition* and
- b) the paper discusses AC in *relation to climate change strategy* (CCS).

Obviously, if the paper discusses CCS it also includes the component “refers to strategy” since CCS is a subtopic of strategy in general. It is important that a similar term is not used to in a similar connotation within this reference as the attention is put on the concept of AC and CCS. Still, the term AC can be linked to a different theoretical concept if it provides information on factors driving or influencing AC. The last column “study refers to decision-making” is integrated since it can provide interesting insights on strategy relation to decision-making process. As this is not the focus of this work, information on this can or cannot be given within the references. If the study provides information they were extracted as well and analysed.

A reference was ranked as **B reference**, if it is not an A reference and if the paper mentions the term AC and did or did not provide a definition of AC. The focus here is that AC is linked to or described by a different term or *concept* which means that within the references a *concept with a similar connotation* was discussed. The next criterion for being ranked as B reference is that this different term is linked to CCS. For the columns “study refers to strategy” and

²¹⁶ SCHALTEGGER, S. et al. (2002), p. 19.

“decision-making” the same applies as described above. The references were **ranked with C** if a different term was used to describe the capacity of a company to adapt in relation to strategy and types of changes but *not climate change*. Within this special case it is possible that references refer to strategy or decision-making or strategy and decision-making. Hereby, a differentiation between these papers was not done but it is important that the study discussed at least one of these issues. The remaining references were **classified with D** and all combinations except the combinations already given in the A, B and C paper are possible. These papers only have a low impact for answering the research questions but some of these papers still provide an interesting insight and are used for deeper understanding.

About 31 studies were mentioning the term AC and thereof 15 provided a definition of AC. Appendix A.6 Table 17 shows a detailed classification by impact and reference. At the beginning of Chapter 4, I stated that it is expected that there are very few conducted references which are discussing AC related to CCS within the business context. At this point, this assumption is proved. Only 6 references – classified as A references - as shown in Table 11 discussed AC in the context of CCS. Additionally, 3 references were conducted as high-medium impact and mentioned AC but focused on a different term in relation to CCS. Furthermore, 16 references were ranked as C references. However, the majority (35 references) were rated with a D. Based on this we now have a look at the references, ranked as A and B references. In the following, I compare what these authors state about AC and CCS starting with the A references. Table 12 provides an overview of definitions and statements on climate change strategy of all A papers.

As we can see from the Table 12 LISØ and HERTIN et al. refer to the definition of the IPCC. In Chapter 2 we discussed AC and its importance in the field of climate change research in which the definition of MCCARTHY from the IPCC gained importance. JOHNSTONE defines AC as the conditions given and needed to develop and execute adaptation options.²¹⁷ BERKHOUT/HERTIN/NIGEL define AC as a property of a company which is dependent on external relationships, more precisely, the social and economical context in which the company is operating.²¹⁸ They further view AC as a determinant which influences the company’s awareness of vulnerability and their ability to evaluate and make decisions about adaptation with regard to climate change.²¹⁹ This view on AC is similar to the definition provided by BEERMANN where AC is seen as a “measure of the culture and dynamics of an organization that allow it to make decisions in a timely and appropriate manner both in day-to-day business and also in crises”.²²⁰

²¹⁷ See JOHNSTONE, K. (2008), p. 135.

²¹⁸ See BERKHOUT, F.; HERTIN, J.; NIGEL, A. (2004), p. 2.

²¹⁹ See BERKHOUT, F.; HERTIN, J.; NIGEL, A. (2004), p. 16.

²²⁰ See MCMANUS, S. et al. (2007), p. 2 cited in BEERMANN, M. (2011), p. 840.

Table 12: Definitions of AC and statements on strategy and climate change by author

Author	Definition of Adaptive Capacity	Climate Change Strategy
BEERMANN, M. (2011)	BEERMANN refers to the definition by the RESILIENT ORGANIZATIONS REPORT (2007): “the measure of the culture and dynamics of an organization that allow it to make decisions in a timely and appropriate manner both in day-to-day business and also in crises.” ²²¹	Considering that coping with impacts caused by climate change necessitates pro-active and innovative coping, clarifies the passive character of adaptive capacity according to RESILIENT ORGANIZATIONS. According to SCHUMPETER (1934) successful strategy building and long term viability of organizations need creative solutions. Building adaptive capacity also means creating new business models, products, ways of planning and producing and so forth. ²²²
BERKHOUT, F. ET AL. (2004) / BERKHOUT, F. ET AL. (2006)	“Adaptive capacity appears to be a property of an organisation, as well as the social and economic context in which it is operating” ²²³ Furthermore AC is a set of internal capabilities: <ul style="list-style-type: none"> • risk management process • inhouse technical expertise • internal communication • and external relationships: • to other stakeholders • and actors needed for help to implement adaptations²²⁴ 	Strategy development formulates an overall strategic approach towards climate change adaptation. It set out strategies to respond to the risks and opportunities posed by each key impact. ²²⁵ [...] “An adaptation strategy expresses the present and the desired future position of a company in relation to climate change impacts. It also helps to communicate a company’s attitude towards climate change internally and externally.” ²²⁶ 4 types of strategy related to climate change: ²²⁷ <ol style="list-style-type: none"> 1. Wait and see 2. Risk assessment and options appraisal 3. Bearing and managing risk 4. Sharing and shifting risks
HERTIN, J. ET AL. (2003)	HERTIN et al. refer to the definition of McCarthy from the IPCC Report: “The ability of a system to adjust to climate change (including climate variability and extremes), to moderate potential damages, to take advantage of opportunities, or to cope with the consequences.” ²²⁸	“[...] the portfolio of options adopted by any given firm will depend on their climate sensitivity, their internal resources and capabilities, their market and regulatory context, and the adaptation strategy they adopt (‘wait and see’, risk bearing, etc.).” ²²⁹ “A review of potential adaptation measures suggested that three different modes of adaptation could be distinguished: <ul style="list-style-type: none"> • commercial adaptation • technological & financial adaptation [...].”²³⁰
JOHNSTONE, K. (2002)	“Adaptive capacity, on the other hand, is the information, social capital and supportive conditions that are needed as a foundation for delivering adaptation actions.” ²³¹	In the broad sense he refers to strategy in the context of adaptation strategies to Climate Change: “Most adaptation measures can be integrated with other systems and procedures, such as the existing risk register, health and safety arrangements, quality management, business continuity planning or strategic planning.” ²³²

²²¹ See MCMANUS, S. et al. (2007), p. 2 cited in BEERMANN, M. (2011), p. 840.

²²² See BEERMANN, M. (2011), p. 840.

²²³ BERKHOUT, F.; HERTIN, J.; NIGEL, A. (2004), p. 4.

²²⁴ See BERKHOUT, F.; HERTIN, J.; NIGEL, A. (2004), p. 14.

²²⁵ BERKHOUT, F.; HERTIN, J.; NIGEL, A. (2004), p. 27.

²²⁶ BERKHOUT, F.; HERTIN, J.; NIGEL, A. (2004), p. 28.

²²⁷ See BERKHOUT F.; HERTIN, J.; GANN, D. M. (2006), p. 151.

²²⁸ HERTIN, J. et al. (2003), p. 280.

²²⁹ HERTIN, J. et al. (2003), p. 280.

²³⁰ HERTIN, J. et al. (2003), p. 284.

²³¹ JOHNSTONE, K. (2008), p. 135.

²³² JOHNSTONE, K. (2008), p. 136.

Author	Definition of Adaptive Capacity	Climate Change Strategy
LISØ, K. R. (2006)	LISØ refers to the definition of McCarthy from the IPCC Report: “is the ability of a system to adjust to climate change, including climate variability and extremes, to moderate potential damages, to take advantage of opportunities, or to cope with the consequences.” ²³³	“In order to develop adaptation strategies, effective ways must be found to strengthen institutional capacity. Cross-disciplinary risk-based management strategies, [...] can be an important step towards a more active and dynamic way [...] in the light of the unknown risks of future climate change.” ²³⁴ This includes either: risk-based, precautionary or discursive strategy and depends on the risk. ²³⁵

(Own illustration.)

The papers of BERKHOUT ET AL. were originated within the ADAPT Project at the TYNDALL CENTRE FOR CLIMATE CHANGE RESEARCH.²³⁶ Within this work the main findings were that companies might enhance their AC through organisational learning processes and using their dynamic capabilities (in the following abbreviated with DC).²³⁷ The authors use the organisational learning process to build a conceptual framework for an adaptation process within organisations. As the authors state they refer to the concept of organisational learning (OL) as climate change has impacts on organisational routines and these are adjusted by learning.²³⁸ I examine the term OL more detailed within the next chapter.

However, at this point it can be stated that these definitions are not highly differing from the definitions of AC given in chapter 2.1 as it exhibit endogenous character, the capability to learn, to adapt and to make decisions on adaptation options which is the same as foster innovation and use opportunities to cope with climate change.²³⁹

Moreover, AC is seen as precedent to establish adaptation options, which is as we remember from Chapter 2, comparable to CHAKRAVARTY’S view on AC.²⁴⁰ As JOHNSTONE states AC is needed to deliver adaptation options which can be and needed to be integrated into strategic planning as it can avoid losing money or missing opportunities.²⁴¹ Furthermore, these strategies need to be reviewed regularly since climate change is a continuous change.²⁴² Therefore, planning for adaptation options should be a dynamic process by constantly reviewing if the company is vulnerable, to what extend and possible options against it.²⁴³ LISØ discuss AC within a risk-management approach and states that companies need to know their current and future risks and thus cross-disciplinary risk management strategies i.e., precautionary and discursive strategies are needed. *Precautionary strategies* include the development of policies on mitigation, adaptation, monitoring and continuous research.²⁴⁴ *Discursive strategies* there-

²³³ LISØ, K. R. (2006), p. 3.

²³⁴ LISØ, K. R. (2006), p. 8.

²³⁵ LISØ, K. R. (2006), p. 9.

²³⁶ It is a research centre investigating research into climate change impacts with regard to solutions for society and ecosystems. Within the ADAPT project research was contemplated on impacts for business and how businesses can cope with climate change effects. See therefore: TYNDALL CENTRE FOR CLIMATE CHANGE RESEARCH (eds.) (2011), <http://www.tyndall.ac.uk/research/adaptation> © 2011.

²³⁷ See BERKHOUT, F.; HERTIN, J.; NIGEL, A. (2004), p. 11, BERKHOUT F.; HERTIN, J.; GANN, D. M. (2006), p. 139.

²³⁸ See BERKHOUT, F.; HERTIN, J.; NIGEL, A. (2004), p. 7, BERKHOUT F.; HERTIN, J.; GANN, D. M. (2006), p. 137f.

²³⁹ See chapter 2.1 table 2 “Overview of explicitly inherent components of adaptive capacity”.

²⁴⁰ See remarks to CHAKRAVARTY’S theory discussed within chapter 2.1.3.

²⁴¹ See JOHNSTONE, K. (2008), p. 133.

²⁴² See JOHNSTONE, K. (2008), p. 135f.

²⁴³ See JOHNSTONE, K. (2008), p. 134.

²⁴⁴ See LISØ, K. R. (2006), p. 5f.

by means including all actors to address climate change issues along vertical decision-making lines.²⁴⁵ Within the ADAPT Project three different types of adaptation i.e., commercial, financial and technological. *Commercial adaptation* is meant in the form of business strategy e.g., sustainable business solutions i.e., new services, new modular systems and so forth.²⁴⁶ *Financial adaptation* includes different contractual arrangements, increased investment in insurance but only if economically justifiable.²⁴⁷ *Technological adaptation* includes new technical solutions and cooperation with other actors such as users to reduce costs for developers.²⁴⁸ These adaptation options do not strongly differ from decisions on strategies caused by any other strategic decisions.²⁴⁹ It includes assessing risk and opportunities to key issues affected by climate change and expresses desired future position of the company to climate change.²⁵⁰

Taking the above presented facts into account a climate change strategy includes technological, financial and commercial solutions based on risk assessment needed to be improved regularly and thus it is a dynamic process. As BEERMANN sums up it is about creating new business models, products, ways of planning and producing and so forth.²⁵¹ Furthermore, AC for linked to a strategy on climate change since AC is existent within a company and raises awareness of climate change and vulnerability.

These findings within the A references can be supported by the B references. Even though the authors do not use the term AC, the concepts can be seen as concepts with the same aim and meaning and are presented in Table 13.

Table 13: Similar concepts and statements on strategy and climate change by author

Author	Adaptive capacity & similar term	Climate Change Strategy
KORHONEN & SEAGER (2008)	“‘Adaptability’ describes the ability of an organization to change practices, resource allocations, designs, relationships or other aspects of the business in response to changing conditions.” ²⁵²	“Business strategy with regard to sustainability is currently dominated by an eco-efficiency approach.” ²⁵³ “As the focus of business concern expands from environmental management to sustainable development, so must the basis of environmental strategy expand from a risk to a resilience approach.” ²⁵⁴

²⁴⁵ See LISØ, K. R. (2006), p. 6.

²⁴⁶ See HERTIN, J. et al. (2003), p. 284f., BERKHOUT F.; HERTIN, J.; GANN, D. M. (2006), p. 13.

²⁴⁷ See BERKHOUT F.; HERTIN, J.; GANN, D. M. (2006), p. 13.

²⁴⁸ See BERKHOUT F.; HERTIN, J.; GANN, D. M. (2006), p. 13f.

²⁴⁹ See BERKHOUT, F.; HERTIN, J.; NIGEL, A. (2004), p. 16.

²⁵⁰ See BERKHOUT, F.; HERTIN, J.; NIGEL, A. (2004), p. 28.

²⁵¹ See BEERMANN, M. (2011), p. 840.

²⁵² KORHONEN, J.; SEAGER, T. P. (2008), p. 412.

²⁵³ KORHONEN, J.; SEAGER, T. P. (2008), p. 411.

²⁵⁴ KORHONEN, J.; SEAGER, T. P. (2008), p. 414.

Author	Adaptive capacity & similar term	Climate Change Strategy
MILLS, E. (2003)	MILLS sees adaptive capacity as a characteristic which can be increased by different response options e.g., making buildings more disaster resilient. He focuses on construction industry and impacts of climate change on insurance industry. ²⁵⁵	MILLS states that insurance companies should focus on preparing for and responding to natural disasters and to be more proactive which includes: <ul style="list-style-type: none"> • Economic and technology (i.a. technically focus risk-management e.g. Geographic Information Systems) • Policy (raising awareness of climate change problems by being active on a policy level e.g UN Insurance Industry Initiative for the Environment within UNEP)
WEDAWATTA ET AL. (2010)	Coping capacity is "the ability of people or organisations to limit adverse consequences of ewes, using available resources and capabilities" ²⁵⁶ .	"the decision making framework to be developed will be focused around these three key issues of concern" including reducing vulnerability, improving coping capacities and implement coping strategies, which are "actions that increase the ability to prevent, tolerate and/or recover from impacts" ²⁵⁷

(Own illustration.)

KORHONEN & SEAGER mentions the term adaptability as part of the resilience concept which describes the ability of organisations to change business practices and aspects. His definition is similar to the findings above. MILLS does not really define the term AC but he mentions respond options which can increase AC. WEDAWATTA/INGIRIGE/AMARATUNGA focus on resilience and define the term coping capacity as the ability to use resources and capabilities to limit impacts of EWEs.

KORHONEN & SEAGER discusses the concept from an eco-efficiency perspective. Eco-efficiency strategies are strategies which integrate sustainability into measurable operational objectives e.g., lean manufacturing and waste minimisation.²⁵⁸ With regard to strategy formulation it provides the advantage of measurability but the author argues that long-term strategies which might be inefficient from an eco-efficiency perspective should be established.²⁵⁹ He states that organisations should go beyond their aim to achieve efficiency and sees resilience thinking as needed to be integrated into strategic management.²⁶⁰ He points out that in contrast to common management planning instruments such as scenario-analysis, resilience adds a new dimension by preparing a company to adapt to unusual and unexpected scenarios.^{261,262} WEDAWATTA/INGIRIGE/AMARATUNGA also stress the need of resilience thinking but not explicitly with regard to strategic management. He discusses the need to think about resilience and consider the wider impacts of ewe's as they affect business and supply chains.²⁶³

²⁵⁵ See MILLS, E. (2003), p.

²⁵⁶ WEDAWATTA, G.; INGIRIGE, B.; AMARATUNGA, D. (2010), p. 369.

²⁵⁷ WEDAWATTA, G.; INGIRIGE, B.; AMARATUNGA, D. (2010), p. 369.

²⁵⁸ See KORHONEN, J.; SEAGER, T. P. (2008), p. 411.

²⁵⁹ See KORHONEN, J.; SEAGER, T. P. (2008), p. 412.

²⁶⁰ See KORHONEN, J.; SEAGER, T. P. (2008), p. 415.

²⁶¹ See KORHONEN, J.; SEAGER, T. P. (2008), p. 413. The author argues that the constraint to scenario-analysis within common risk management is that it only forecasts scenarios based on the business-as-usual scenario.

²⁶² The idea of integrating resilience thinking was also contemplated by GÜNTHER who developed a resilience management framework. See GÜNTHER, E. (2009).

²⁶³ See WEDAWATTA, G.; INGIRIGE, B.; AMARATUNGA, D. (2010), p. 368.

MILLS also views technological options and policy engagement as pro-active strategies to address the impacts of climate change.

So far, the A and B references were examined. The question still is whether AC only exists and has a passive character or if it can be shaped actively by organisations. Will companies chose the wrong strategy on climate change if they do not have AC? Can companies increase their AC and how? I aim at answering these questions within the next chapter 4.2.3 when I examine different theoretical concepts relating to AC. As a result I do not analyse C references as these C references are the references explaining AC within different contexts.

Within the D references some paper just focused on strategies to climate change. We will see how these references contribute to an understanding of CCS and to research question 3. Within the scope of this work I just discuss three interesting paper. Table 14 gives an overview of paper conferred to the dimensions of CCS developed in chapter 2.2.2.

DUNN provides an overview of corporate strategies to climate change. He states, that most companies placed climate change in the realm of risk management.²⁶⁴ Now companies consider different factors into their business response to climate change such as: evolving technologies, negotiations, flexibility mechanisms, sectoral & regional differentiation and leadership.²⁶⁵

Evolving technologies obviously include reducing GHG emissions and energy efficiency. *Negotiations* include active engagement within policy to raise awareness of climate change and influence regulation processes. *Flexibility mechanisms* include internal and external control mechanisms whereas the internal include GHG inventory and management systems, reduction targets and investment into new technology or used resources. External mechanisms include emissions trading and growing action in Kyoto protocol mechanisms. *Sectoral & Regional differentiation* adds the aspects to climate change responses that depending on region companies use different actions. *Leadership* means that some companies take early adaptation options since they aim at leadership positions to achieve competitive advantage.²⁶⁶

JESWANI/WEHRMEYER/MULUGETTA distinguish between four categories and classifies companies in: indifferent, beginner, emerging and active. He defines *indifferent* companies as those companies who have not yet taken the first step in addressing climate change which is monitoring and environmental systems. *Beginners* are companies who started to invest into energy efficiency and environmental management programs. The *Emerging* cluster include companies which are aware of climate change, already set targets to reduce GHG and are involved in external activities. *Active* companies have a fully developed environmental management system and invest in changes in products, emissions reductions and engage actively with external stakeholders.²⁶⁷ LEVY & KOLK use a different classification system derived from GLADWIN & WALTER and distinguish between resistant, avoidant, compliant and proactive.²⁶⁸

²⁶⁴ DUNN (2002), p. 28.

²⁶⁵ DUNN, S. (2002), p. 29ff.

²⁶⁶ DUNN, S. (2002), p. 29ff.

²⁶⁷ See JESWANI, H. K.; WEHRMEYER, W.; MULUGETTA, Y. (2008), p. 52f.

²⁶⁸ See LEVY, D. L.; KOLK, A. (2002), p. 289.

Table 14: Comparison of strategy papers with dimensions of CCS

Dimensions of CCS Author	goals & objectives (carbon footprint)	Market opportunities	Thinking about policy framework	Level of commitment	Education within company	Strategic timing
BOIRAL ²⁶⁹	+	-	+	-	-	-
DUNN ²⁷⁰	+	+	+	+	-	+
HART ²⁷¹	+	+	+	-	-	-
JESWANI ²⁷²	+	+	+	+	-	-
KOLK ²⁷³	+	+	+	-	-	-
LEVY ²⁷⁴	+	-	+	+	-	-
PORTER ²⁷⁵	+	+	+	+	-	-

+ also discussed by author - not discussed by author

(Own illustration.)

As we can see the discussion on what a CCS is varies and proving the statement in chapter 2.2.2 that there is no common definition of a CCS. So far it can be said that CCS needs new technological solutions, new business opportunities and most importantly an even higher communication with stakeholders as the issue of climate change cannot be addressed by companies alone. However, these findings are not new conferred to discussion in CCS within chapter 2.2. The only new finding is the classification of types of strategic responses to climate change. Which fact was also pointed out is that companies need to think about their value and supply chain even beyond internal processes.²⁷⁶ HART points at the role of climate change impacts within companies and that they need to formulate a vision with regard to climate change.²⁷⁷ Within the paper the aspect of internal resources and the need to look inside-out is barely discussed. Only PORTER argues that “business leaders need to look inside out”.²⁷⁸

4.2.3 Underlying theoretical concepts

Studying the C and remaining D references, it is striking that the mentioned underlying theoretical concepts are very heterogeneous. For example, BERKHOUT ET AL. study the concept of organisational learning (in the following abbreviated with OL). This finding one might argue is not surprising since the concept of organisational learning is often used to explain the process of adaptation to climate change.²⁷⁹ Furthermore, the relation to organisation theory is not surprising since it is being discussed in relation to adaptation processes and change within companies. CHAKRAVARTY already investigated research of AC and organisational adaptation

²⁶⁹ See BOIRAL, O. (2006), p. 323f.

²⁷⁰ See DUNN, S. (2002), p. 28ff.

²⁷¹ See HART, S. L. (1997), p. 71ff.

²⁷² See JESWANI, H. K.; WEHRMEYER, W.; MULUGETTA, Y. (2008), p. 52ff.

²⁷³ See KOLK, A.; LEVY, D. (2001), pp. 308-311. Within the paper of 2001 KOLK, A.; PINSKE, J. (2004) do not discuss strategies. They discuss coming changes through climate change and implications for business. This paper is therefore not examined further.

²⁷⁴ See LEVY, D. L.; KOLK, A. (2002), p. 287.

²⁷⁵ See PORTER, M. E.; VAN DER LINDE, C. (1995), p. 123, PORTER, M. E.; REINHARDT, F. (2007), p. 23.

²⁷⁶ See KOLK, A.; PINSKE, J. (2004), p. 319f. and PORTER, M. E.; REINHARDT, F. (2007), p. 24.

²⁷⁷ HART, S. L. (1997), p. 73.

²⁷⁸ PORTER, M. E.; REINHARDT, F. (2007), p. 23.

²⁷⁹ See NITKIN, D.; FOSTER, R.; MEDALYE, J. (2009), p. 9.

in the early 1980s.²⁸⁰ Due to the variety of underlying concepts and research contexts, it is not feasible to explain and discuss all of them. I only consider them as deep as necessary to understand definitions, factors, implications for AC and possible relation to CCS. To give an overview as complete as possible over the references, I classify the references regarding their main concept and the driver of change which is examined within the study. Within Appendix A.5 Table 15 the observed theoretical concept, the according school thought / theory, observed driver of change and relations observed to other concepts are listed.

Concepts which were observed within the references are organisational learning, organisational change capacity, organisational learning capability, dynamic capabilities, strategic flexibility, resilience, agility, adaptability, complex adaptive systems, absorptive capacity and several more. Starting with two papers discussing AC I go on analysing these concepts giving a brief definition and answering the following questions:

- (1) What do they say about adaptive capacity?
- (2) What do they say about strategy and strategy formulation?
- (3) Are there any links between adaptive capacity and strategy within references?

Adaptive Capacity

SUSSMAN views AC as a critical dimension to organisational performance.²⁸¹ He defines AC as the “ability to advance the organization’s mission by strategically changing in anticipation of and in response to changed circumstances and in pursuit of enhanced results.”²⁸² He provides a very important insight on AC within business context and for strategic implications. The author stresses the fact that AC should not be mixed up with the adaptation process which is basically the targeted fit to external circumstances and should be seen from a more dynamic view that it is also the ability to initiate change.²⁸³ The author mentions four aspects organisations should think of when trying to build AC:

External Focus means that organisations should be aware of the complexity and the dynamism existing in their operating environments. This also includes to not only adapt but also to influence their environments e.g., through more proactive communication.²⁸⁴

Network Connectedness is described as considering problems with other organisations or external partners such as stakeholders. The author states that not all problems have to and can be solved alone by the organisation. This means a company should consider building strategic alliances through “aggregation of independent efforts, create the potential for system-level effects that advance their missions more effectively than it would be possible in isolation.”²⁸⁵

²⁸⁰ See the statements on adaptive capacity within the business context in Chapter 2.1.3.

²⁸¹ See SUSSMAN, C. (2004), p. 1.

²⁸² SUSSMAN, C. (2004), p. 3.

²⁸³ See SUSSMAN, C. (2004), pp. 3-4.

²⁸⁴ See SUSSMAN, C. (2004), p. 12f.

²⁸⁵ See SUSSMAN, C. (2004), p. 14f.

Inquisitiveness means the willingness to learn and the author hereby refers to OL. He states that an adaptive organisation is inquisitive to seek out data and information; use it to learn, and then to apply and share it.²⁸⁶

Innovation is a critical characteristic of AC which relies on OL to create and implement new ideas.²⁸⁷

These four factors of AC make it clear that building adaptive capacity is nothing which is easily planned and implemented; instead it is an ongoing process.

MCCANN/SELISKY/LEE also discuss the term AC as the "amount and variety of resources and skills possessed and available for maintaining viability and growth relative to the requirements posed by the environment".²⁸⁸ The author further state *resiliency*²⁸⁹ and *agility* as two dimension of AC. *Agility* is "the capacity for moving quickly, flexibly and decisively in anticipating, initiating and taking advantage of opportunities and avoiding any negative consequences of change".²⁹⁰ Building AC requires attention to resiliency and agility, building both at different levels and thinking of them on a strategic level.²⁹¹

Both papers do not refer to strategic management and links to AC. However, they mention determinants and factors usable for building AC.

Organisational learning

Organisational learning (in the following abbreviated with OL) is a concept of organisational change and is discussed within organisation theory.

BEAUCHAMP-AKATOVA focuses on *adaptive learning*²⁹² as basis to *increase AC* of a company. The author states that learning includes the process of reflecting, questioning and reframing strategic problems.²⁹³ Furthermore, they refer to the concept of *continuous innovation* as a special form of learning process which is the "planned, organized and systematic process of ongoing, incremental and company-wide changes of existing practices."²⁹⁴ Thereby continuous innovation increases operational effectiveness (the capability to satisfy today's customer demands) and *strategic flexibility* (the capability to develop new market approaches, processes, competencies). By that, the continuous innovation process supports the *enhancement of AC* through a better interpretation of external or environmental factors.²⁹⁵ The knowledge about these factors is seen as the second important issue of organisational learning. OL is more than just integrating acquired knowledge or existing experience it also includes the pro-

²⁸⁶ See SUSSMAN, C. (2004), p. 16. I remark, that the author points out that this problem especially applies for non-profit organisation which he is observing within this study.

²⁸⁷ See SUSSMAN, C. (2004), p. 17.

²⁸⁸ MCCANN, J.; SELISKY, J.; LEE, J. (2009), p. 45.

²⁸⁹ The definition of resiliency does hereby not differ from the understanding of resilience given in chapter 2.

²⁹⁰ MCCANN, J.; SELISKY, J.; LEE, J. (2009), p. 45.

²⁹¹ See MCCANN, J.; SELISKY, J.; LEE, J. (2009), p. 49f. They also state actions to build adaptive capacity.

²⁹² The term adaptive learning goes back to CYERT & MARCH and describes that organisations adapt over time to small and incremental changes such as pressure from the stakeholders, attention (only direct and urgent concerns are considered) and behaviour of problem solving (successful solutions are selected and made regular practice. See STAEBLE, W. H. (1994), p. 865.

²⁹³ See BEAUCHAMP-AKATOVA, E. (2009), p. 364.

²⁹⁴ See BEAUCHAMP-AKATOVA, E. (2009), p. 362. See also LIEN, B. Y.-H.; HUNG, R. Y.; MCLEAN, G. N. (2011), p. 214.

²⁹⁵ See BEAUCHAMP-AKATOVA, E. (2009), p. 363.

cess of reflecting and questioning of existing policies within an organisation.²⁹⁶ Furthermore, the author stresses the need for organisational memory to obtain the global organisational picture.²⁹⁷

While BEAUCHAMP-AKATOVA views OL as an increasing factor of AC BERKHOUT ET AL. discuss OL and AC separately.²⁹⁸ He refers *operational* and *dynamic capabilities* as important factors influencing routines²⁹⁹ within an OL process.³⁰⁰

LIEN/HUNG/MCLEAN state that OL can be seen as an adaptive capacity of an organisation not something what increases adaptive capacity.³⁰¹ Within their case study they found three key factors in the OL process: OL goal (to improve organizational effectiveness), OL strategy (to implement OL through e.g., knowledge management systems) and OL techniques to implement OL concepts (including study groups to encourage people to absorb new knowledge).³⁰²

PRIETO & REVILLA add to this in a different way by defining the term *learning capability* which is comprised of 2 dimensions: knowledge stocks i.e., knowledge and knowing and learning flows i.e., the interaction of knowers.³⁰³ The link between both is described by absorptive capacity.

JEREZ-GOMEZ ET AL. investigate in *organisational learning capability* (in the following referred to OLC) as a *strategic key resource* to gain competitive advantage. The authors mention different dimensions of OLC such as managerial commitment, system perspective, openness and experimentation and knowledge transfer and integration. *Managerial commitment* is described as the recognition of the relevance of learning by management and creating a culture which ensures successful acquisition, creation and transfer of knowledge. *System perspective* means the aspect that the structure should enable organisational learning through e.g., the awareness of all individuals and departments of company's objectives and how they can contribute to it. *Openness and experimentation* includes the acceptance of all new ideas and opinions coming from in and outside the organisation which is often referred to the term double-loop learning³⁰⁴. The last dimension which is knowledge transfer can be basically described through *absorptive capacity*.³⁰⁵

BARNETT ET AL. discusses OL as an adaptive response within the context of evolutionary theory which investigates in reaction of companies to changing environmental pressure to achieve fit to these new circumstances. OL leads hereby to performance enhancing capabilities.³⁰⁶ On the contrary, there are constraints to OL which means that when organisations have learned

²⁹⁶ See BEAUCHAMP-AKATOVA, E. (2009), pp. 364-365.

²⁹⁷ See BEAUCHAMP-AKATOVA, E. (2009), p. 365.

²⁹⁸ See BERKHOUT, F.; HERTIN, J.; NIGEL, A. (2004), p. 6 and BERKHOUT F.; HERTIN, J.; GANN, D. M. (2006), p. 137ff.

²⁹⁹ Routines include rules, procedures, strategies, technologies and cultures which need to change in novel situations requiring a set of specific capabilities, i.e. operational and dynamic capabilities. BERKHOUT, F.; HERTIN, J.; NIGEL, A. (2004), p. 7.

³⁰⁰ BERKHOUT, F.; HERTIN, J.; NIGEL, A. (2004), p. 9ff.

³⁰¹ See LIEN, B. Y.-H.; HUNG, R. Y.; MCLEAN, G. N. (2011), p. 215.

³⁰² See LIEN, B. Y.-H.; HUNG, R. Y.; MCLEAN, G. N. (2011), p. 223f.

³⁰³ See PRIETO, I. M.; REVILLA, E. (2010), p. 500f.

³⁰⁴ Double-loop learning can be described as learning for change and results in a change in values of theory-in-use and strategies and assumptions through experienced and new circumstances. See therefore ARGYRIS, C.; SCHÖN, D. A. (1998), p. 21f. and PROBST, G. J. B.; BÜCHEL, B. S. T. (1994), p. 36f.

³⁰⁵ See JEREZ-GÓMEZ, P.; CÉSPEDES-LORENTE, J.; VALLE-CABRERA, R. (2005), p. 717f.

³⁰⁶ See BARNETT, W. P.; GREVE, H. R.; PARK, D. Y. (1994), p. 12.

and criteria for success changes then performance will decrease.³⁰⁷ It also means that when organisations have established a successful strategy the less the organisation will be prompted to improve.³⁰⁸ This is equal to the idea of strategic persistence.³⁰⁹ The authors also mention *constraints to adaptability* of a company which can be seen in multimarket, multiunit strategy and structure.³¹⁰ This has important implications for adaptation which was by some strategy researchers seen as something a company should aim at but extreme adaptation is not a robust system since conditions may change.³¹¹ This leads to the question whether this also applies for the climate change issue. It implies that a company can be too well adapted to climate change strategically.

What can we learn from OL for adaptive capacity and strategy?

Considering the different definitions of OL there is no relation to AC since it is either seen as an increasing factor to AC, equal to AC or as a separate concept. Although OL shapes strategy of a company no evidence is provided about the relation of AC to strategy.

Absorptive Capacity

LICHTENHALER investigates research to a special concept of organisational learning called *absorptive capacity* which is the ability of a firm to utilize external knowledge.³¹² This happens through exploratory and exploitative learning³¹³. Hereby, exploratory learning means acquiring new knowledge and exploitative learning means applying the acquired knowledge. The process of balancing both which is called transformative learning is especially needed in turbulent environments and the faster the environmental change is the more important becomes process of transforming acquired knowledge into applied knowledge.³¹⁴ The author states that absorptive capacity is important to dynamic capabilities because DCs depend on underlying learning processes.³¹⁵ LICHTENHALER further states that building a stock of market and technology knowledge will increase a company's *ability to adapt* to environmental changes.³¹⁶ Moreover, as PRIETO & REVILLA states these stocks depreciate over time why the process of learning is so important.³¹⁷

What can we learn from absorptive capacity for adaptive capacity and strategy?

Gaining and using new knowledge through learning process increases a company's AC. As absorptive capacity is part of OL this is not surprising.

³⁰⁷ See BARNETT, W. P.; GREVE, H. R.; PARK, D. Y. (1994), p. 13.

³⁰⁸ See BARNETT, W. P.; GREVE, H. R.; PARK, D. Y. (1994), p. 14.

³⁰⁹ See AUDIA, P. G.; LOCKE, E.; SMITH, K. G. (2000), p. 850.

³¹⁰ See BARNETT, W. P.; GREVE, H. R.; PARK, D. Y. (1994), p. 15.

³¹¹ See BARNETT, W. P.; GREVE, H. R.; PARK, D. Y. (1994), p. 25.

³¹² See PRIETO, I. M.; REVILLA, E. (2010), p. 518 and WANG, C. L.; AHMED, P. K. (2007), p. 37. This goes back to COHEN, W. M.; LEVINTHAL, D. A. (1990), p. 128f. They first discussed the term absorptive capacity as driver and crucial factor to a company's innovation capability and defined it as "the ability to recognize the value of new information, assimilate it and apply it to commercial ends".

³¹³ See LICHTENHALER, U. (2009), p. 822.

³¹⁴ See LICHTENHALER, U. (2009), p. 825f. This is also stressed by AUDIA, P. G.; LOCKE, E. A.; SMITH, K. G. (2000). PRIETO & REVILLA define that as learning capabilities which have to be build to survive in rapidly changing environments. See PRIETO, I. M.; REVILLA, E. (2010), p. 503.

³¹⁵ See LICHTENHALER, U. (2009), p. 823. The necessity of OLC for strategic issues is also pointed out by JEREZ-GÓMEZ, P.; CÉSPEDES-LORENTE, J.; VALLE-CABRERA, R. (2005), p. 716.

³¹⁶ See LICHTENHALER, U. (2009), p. 825.

³¹⁷ See PRIETO, I. M.; REVILLA, E. (2010), p. 518.

Organisational Change Capacity

JUDGE/NAOUMOVA/DOUGLAS view *organisational change capacity* as part of dynamic capabilities. The author view OCC as the potential to have adaptive capacity.³¹⁸ OCC is a dynamic organizational capability and is defined as ability “to adapt old capabilities to new threats and opportunities, as well as create new capabilities” and defines it as resource bundle facilitating organisational change.³¹⁹ The authors refer to the AC definition of STABER & SYDOW where AC and Adaptation are distinguished as adaptation aims at achieving fit and AC is about constantly changing and being in a dynamic position.³²⁰ KLARNER/PROBST/SOPARNOT follow this assumption.³²¹

They investigate into OLC and OCC in order to ensure constant change and survival.³²² OCC is needed to change and adapt strategies over time. Hereby, strategic change is defined as change in company’s product-market strategic orientation.³²³ Within this context the author states AC as the “ability to cope with unknown future”.³²⁴ This is embedded in organizations. Companies do have AC when “*learning* takes place at a rate faster than the rate of change”.³²⁵ For the author, this is ensured by OCC which might be an AC of a company.³²⁶ OCC is thereby defined as the “ability to develop and implement (change process perspective) appropriate organizational changes (change content perspective) to constantly adapt to environmental evolutions (external context) and/or organizational evolutions (internal context) in either a reactive way (adaptation) or by initiating it (pro-action).”³²⁷ The concept of OCC is further determined by process and context dimensions.³²⁸

BUONO & KERBER also examines OCC as an ongoing capability and is defined as “ability of an organization to change not just once, but as a normal course of events in response to and in anticipation of internal and external shifts, constantly *adapting* to and anticipating changes in its environment”.³²⁹ OCC is described by two facts: first, it is a process of *learning* and adjustment and second, it is the *ability to implement changes*.³³⁰ Even though he does not mention the term AC and its relation to OCC the findings of BUONO & KERBER can still provide insights for understanding of AC. Given the definition of above OCC and the definition of AC in chapter 2 there does not seem to be huge differences in what both concepts are aiming at and how they are defined. As we remember from chapter 2 explicit components of AC defini-

³¹⁸ JUDGE, W. Q.; NAOUMOVA, I.; DOUGLAS, T. (2009), p. 1749.

³¹⁹ JUDGE, W. Q.; ELENKOV, D. (2005), p. 893 as cited in JUDGE, W. Q.; NAOUMOVA, I.; DOUGLAS, T. (2009), p. 1739f. The resource bundle is comprised of effective human capital with cultural predispositions toward innovation.

³²⁰ See description of „Adaptive capacity from a structuration perspective” given in chapter 2.1.3.

³²¹ See KLARNER, P.; PROBST, G.; SOPARNOT, R. (2007), p. 13.

³²² See KLARNER, P.; PROBST, G.; SOPARNOT, R. (2007), p. 3.

³²³ See KLARNER, P.; PROBST, G.; SOPARNOT, R. (2007), p. 23.

³²⁴ KLARNER, P.; PROBST, G.; SOPARNOT, R. (2007), p. 13.

³²⁵ KLARNER, P.; PROBST, G.; SOPARNOT, R. (2007), p. 13.

³²⁶ See KLARNER, P.; PROBST, G.; SOPARNOT, R. (2007), p. 6.

³²⁷ KLARNER, P.; PROBST, G.; SOPARNOT, R. (2007), p. 14f.

³²⁸ See KLARNER, P.; PROBST, G.; SOPARNOT, R. (2007), p. 9ff. Context determinants “are forces or conditions within an organization’s external and internal environments” and process determinants “define capacity for change as “the allocation and development of change and operational capabilities that sustains long-term performance”.

³²⁹ BUONO, A. F.; KERBER, K. W. (2010), p. 10. GLOR, E. D. (2007) also investigates research in organizational capacity to adapt but from a different point of view as the authors above. That is why I do not further examine the paper but the author adds the theory of complex adaptive systems and defines dimension of OCC by variety, reactivity and capacity to self-organized emergence. See GLOR, E. D. (2007), p. 38ff.

³³⁰ See BUONO, A. F.; KERBER, K. W. (2010), p. 10.

tion were e.g., *capability to learn, use opportunities and adaptation*. Comparing both definitions there clearly is a similarity of both concepts.

What can we learn from OCC for adaptive capacity and strategy?

It can be said that OCC is definitely closely linked with AC. KLARNER/PROBST/SOPARNOT and JUDGE/NAOUMOVA/DOUGLAS argue that OCC is an AC at its best. The definition by BUONO & KERBER remembers strongly of the definition of AC. Taking this into account I argue that the concept of OCC can be used to describe AC of a company. Implications for strategies can be seen in the strong relation of OCC and strategy as it is needed to shape strategies. However, the authors stress the fact that adaptation and AC are distinctive concepts and AC is not antecedent to adaptation. OCC is a dynamic concept and therefore it does not aim at achieving fit to certain conditions.

Dynamic Capability

WANG & AHMED investigates research into *dynamic capabilities* as “the firm’s ability to integrate, build, and re-configure internal and external competencies to address rapidly changing environments”.³³¹

WANG & AHMED mentions three main components of DCs: adaptive ability, absorptive capability and innovative capability. *Adaptive capability* is defined as a “firm’s ability to identify and capitalize on emerging market opportunities”. *Absorptive capability* is defined as stated above and *innovation capability* is “firm’s ability to develop new products and/or markets, through aligning strategic innovative orientation with innovative behaviours and processes”.³³² Based on TEECE/PISANO/SCHUEN dynamic capabilities are they key role for strategic management.³³³

NEWY & ZAHRA discuss dynamic and operational capabilities building AC of a company.³³⁴ They refer to absorptive capacity as the key knowledge-based capability influencing operating and dynamic capability pointing out the need to constantly recognize new knowledge.³³⁵ The authors point out that dynamic capabilities are antecedent to operational capabilities as dynamic capabilities are planned on a strategic level and operating capabilities are the necessary execute option.³³⁶

MOHRMAN & WORLEY refer to three different types of dynamic capabilities such as innovation capability, quick implementation capability and lateral capabilities. *Innovation capability* includes the classic understanding of innovation as developing new idea for products, processes and services. *Quick implementation capability* is the ability to use scarce resources and quickly focus on developing and implementing innovations. *Lateral capabilities* include building effective lateral connections as they connect knowledge, build synergies and reduces coordination costs.³³⁷ Building these capabilities is referred to strategic decision-making but

³³¹ TEECE, D. J., PISANO, G.; SCHUEN, A. (1997), p. 516 as cited in WANG, C. L.; AHMED, P. K. (2007), p. 33f.

³³² WANG, C. L.; AHMED, P. K. (2007), p. 37f.

³³³ See TEECE, D. J., PISANO, G.; SCHUEN, A. (1997), p. 515.

³³⁴ See NEWY, L. R.; ZAHRA, S. A. (2009), p.82.

³³⁵ See NEWY, L. R.; ZAHRA, S. A. (2009), p.83.

³³⁶ See NEWY, L. R.; ZAHRA, S. A. (2009), p.83.

³³⁷ See MOHRMAN, S. A.; WORLEY, C. G. (2009), p. 437f.

the authors do not relate strategy or AC with each other. The authors relate self-organising capabilities to AC but did not define that further.³³⁸

KORBANGYANG & USSAHAWANITCHAKIT discuss the term organisational adaptability competency as a dynamic capability define it as competence to modifications or its components to adjust to changes and restoring an equilibrium.³³⁹ This competency is measured by the attributes change learning capability³⁴⁰, operational flexibility orientation³⁴¹, valuable business reaction³⁴², and corporate practice proactiveness. Building organisational adaptability competency is referred to pro-active responses to turbulent environments and should be applied on a strategic level.

Sharma & Vredenburg discuss next to continuous innovation and organisational learning³⁴³ the term Stakeholder Integration which is the ability to establish trust-based collaborative relationships to stakeholder.³⁴⁴

What can we learn from DC for adaptive capacity and strategy?

These two papers do not provide one finding for AC as NEWHEY & ZAHRA view dynamic and operating capabilities as capabilities building AC while WANG & AHMED view adaptive capability as one dynamic capability. Furthermore, the definition of AC varies to the definition discussed so far. Even though MOHRMAN & WORLEY do not relate that to AC, the mentioned capabilities seem to be interesting for an AC definition as these foster changes in companies within a turbulent environment. From these papers no implications for the relation of AC and strategy can be drawn. It can only be said that DC is antecedent to operating capabilities and are discussed on a strategic level. Following SHARMA & VREDENBURG analysis (environmental) strategy develops unique organisational capabilities.

Flexibility

TAN & ZENG state that firms have to build AC in a rapidly changing environment because they cannot remain static.³⁴⁵ They explain that a company needs *strategic flexibility* and efficient *resource utilization* which leads to *higher* sensitivity and *adaptability* to environmental changes.³⁴⁶ The term *strategic flexibility* is defined as the firm capability to respond to environmental demands and the ability to change their current strategies by reposition themselves in a market and change of their strategic game plans.³⁴⁷ The authors link the discussion about strategic flexibility with *resource utilization* which includes the way companies handle their

³³⁸ See MOHRMAN, S. A.; WORLEY, C. G. (2009), p. 442.

³³⁹ See KORBANGYANG, S.; USSAHAWANITCHAKIT, P. (2010), p. 11.

³⁴⁰ See definition as discussed within the concept of OL. It is the ability to absorb and utilize external information from environmental change. See KORBANGYANG, S.; USSAHAWANITCHAKIT, P. (2010), p. 11.

³⁴¹ The "ability of a firm to modifying, refining their operation practices, continuous improving organizational process to response in changing market condition". See KORBANGYANG, S.; USSAHAWANITCHAKIT, P. (2010), p. 11.

³⁴² It is the ability to identify market condition, introduce / modify service to and cope with customer demands. See KORBANGYANG, S.; USSAHAWANITCHAKIT, P. (2010), p. 11.

³⁴³ SHARMA, S.; VREDENBURG, H. (1998), p. 740. They refer to it as higher-order learning but it is defined as discussed within concept of organisational learning.

³⁴⁴ SHARMA, S.; VREDENBURG, H. (1998), p. 735.

³⁴⁵ See TAN, J.; ZENG, Y. (2009), p. 581.

³⁴⁶ See TAN, J.; ZENG, Y. (2009), p. 568.

³⁴⁷ See TAN, J.; ZENG, Y. (2009), p. 566.

resource through exploration³⁴⁸ and exploitation³⁴⁹ of resources. Thereby, exploration needs flexibility and exploitation requires efficiency. These can be seen as two extremes and a company can either invest in exploration or exploitation.³⁵⁰ Furthermore this is linked to the structure of organisation. Efficiency needs a bureaucratic structure whereas this impedes flexibility and thus strategic flexibility.³⁵¹ The opposite of strategic flexibility is *strategic persistence* which is examined by AUDIA/LOCKE/SMITH who state that strategic persistence is a paradox of success. Success decreases information seeking which impedes strategic flexibility by reducing the ability to see environmental changes.³⁵² The authors point out that being open to information *enhances a company's AC*.³⁵³

VOLBERDA discusses the term *organisational flexibility* to control strategic change in flexible markets especially in unanticipated situations. KOBERG states that organisational flexibility is mostly enabled by an organic structure of companies.³⁵⁴ VOLBERDA defines organisational flexibility as a function of two complementary variables: control capability of the management (managerial task) and the changeability of the organization (organisational task).³⁵⁵ The *managerial task* means hereby finding the right 'flexibility mix' increasing the "capabilities which an organization possesses, and the rapidity with which an organization can activate these capabilities".³⁵⁶

This flexibility mix consists of three types: *operational, structural and strategic flexibility*. The *operational flexibility*³⁵⁷ is also called routine manoeuvring capacity and enables a company to rapidly respond to familiar changes e.g., variation of production volume and use of temporary labour. The *structural flexibility* is the *adaptive manoeuvring capacity* and is defined as the capacity of management to adapt its decision and communication process within a given structure e.g., creating multifunctional teams and developing subcomponents with suppliers. The *strategic flexibility* or non-routine steering capacity refers to goal related capabilities and is the most radical type of flexibility and much more qualitative e.g., changing strategies, apply new technologies and creating new product market combinations.³⁵⁸

REED & BLUNSDON state that organisational flexibility *enhances a company's AC* and define it as an "organization's capacity to adjust its internal structures and processes in response to changes in the environment".³⁵⁹ They examine corporate strategy and organisational flexibil-

³⁴⁸ Exploration includes search, variation, risk taking, experimentation, flexibility, discovery and innovation. This means all activities a company pursue to gain new knowledge or resources. See therefore MARCH, J. G. (1991), p. 71.

³⁴⁹ Exploitation includes such things as refinement, choice, production, efficiency, selection, implementation and execution. MARCH, J. G. (1991), p. 71. Exploration and exploitation goes back to organisational theory and basically discuss the trade-off between both and that companies should balance exploitation and exploration.

³⁵⁰ See TAN, J.; ZENG, Y. (2009), p. 565.

³⁵¹ See TAN, J.; ZENG, Y. (2009), p. 566.

³⁵² The importance of strategic flexibility is also stressed by AUDIA/LOCKE/SMITH who discusses why companies still exhibit strategic persistence in times of radical environmental changes. Strategic persistence is a result of past success and the tendency to stick with strategies which have worked in the past. See AUDIA, P. G.; LOCKE, E. A.; SMITH, K. G. (2000), p. 837.

³⁵³ See AUDIA, P. G.; LOCKE, E.; SMITH, K. G. (2000), p. 850.

³⁵⁴ See KOBERG, C. S. (1987), p. 799. The author investigates into organisational structure and adaptive behaviour of organisations.

³⁵⁵ See VOLBERDA, H. W. (1997), p. 170.

³⁵⁶ VOLBERDA, H. W. (1997), p. 171.

³⁵⁷ This operational flexibility further depends on the design of an organisation such as structure, culture and technology. See VOLBERDA, H. W. (1997), p. 171ff.

³⁵⁸ See VOLBERDA, H. W. (1997), p. 171f.

³⁵⁹ See REED, K.; BLUNSDON, B. (1998), p. 457.

ity but could not provide statistically significant findings on a relation but they found out that high goals and in relation with low rules contribute to organisational flexibility.³⁶⁰

What can we learn from flexibility for adaptive capacity and strategy?

Considering the definitions above it can be said that flexibility increases the AC of a company, whereas strategic flexibility seems to have the highest influence. Furthermore, AC should be seen from a dynamic perspective and the challenge to build AC lies in its complexity and uncertainty.

Resilience

BEERMAN discusses resilience as strategic instrument to successfully cope with changing climatic conditions and that resilience thinking stresses the need to proactively change in advance.³⁶¹ The author refers to GÜNTHER who, as already mentioned in chapter 1, investigates into a resilience management framework.³⁶² AC has a passive character to resilience and is a factor which determines resilience and includes all capabilities ensuring that company's can deal with crises, disruptions or external shifts.³⁶³ Building AC includes "creating new business models, products, ways of planning and producing and so forth".³⁶⁴

WEDAWATTA ET AL. also examines the term resilience and mentions the term coping capacity which is defined similarly to BEERMANN as the ability of a company to limit consequences of events using available resources and capabilities".³⁶⁵ Coping capacity is thereby influencing coping strategies which are defined as prevention strategies to reduce impact of events.³⁶⁶

PELLISSIER adds to this discussion from an innovation view and discusses resilience engineering. He defines resilience as the ability of an organisation to sustain competitive advantage through the capability to "(1) deliver excellent performance against current goals, whilst, in paradox, (2) effectively innovating and adapting to rapid, turbulent changes in the environment."³⁶⁷ The author views resilience engineering not just as innovation of new technologies but rather as innovations on all levels e.g., process, product, management, structure, culture and so forth.³⁶⁸

What can we learn from resilience for adaptive capacity and strategy?

AC is related to strategies to cope with climate change but it is not clear whether it is precedent or not. Still, it shows again that AC is an internal ability to use resources and capabilities.³⁶⁹

The following examined concepts and terms are not capabilities of a company but they still provide interesting findings about aspects which have to be considered when addressing climate change strategically and trying to measure and build AC.

³⁶⁰ See REED, K.; BLUNSDON, B. (1998), p. 467.

³⁶¹ See BEERMANN, M. (2011), p. 840.

³⁶² See GÜNTHER, E. (2009).

³⁶³ See BEERMANN, M. (2011), p. 840.

³⁶⁴ BEERMANN, M. (2011), p. 840.

³⁶⁵ WEDAWATTA, G.; INGIRIGE, B.; AMARATUNGA, D. (2010), p. 368.

³⁶⁶ WEDAWATTA, G.; INGIRIGE, B.; AMARATUNGA, D. (2010), p. 369.

³⁶⁷ PELLISSIER, R. (2011), p. 155. See also WHITEMAN, G. et al. (371), p. 372.

³⁶⁸ See PELLISSIER, R. (2011), p. 148.

³⁶⁹ See components of AC definition in chapter 2.1.

Networks

How does the theory of networks apply for this issue? Networks are often established in the case of disruptive change and are a ‘collective’ response to these changes.³⁷⁰ CARNEY discusses within this context the term adaptability and its two dimensions: entrepreneurial and coordinated adaptability.³⁷¹ *Entrepreneurial adaptability* is thereby the “capacity of economic agents to adapt to disturbances caused by relative scarcities indicated by changing factors and product prices”.³⁷² In general it could mean the ability of entrepreneurs to recognize and react to changes. *Co-ordinated adaptability* is defined as the “ability to effect realignments between large-scale dedicated or co-specialized assets located at different stages in an industry value chain”.³⁷³

GULATI/LAWRENCE/PURANAM also investigates in AC related to networks from a procurement point of view. Even though he contemplates AC in vertical relationships his paper adds to this research in two ways: first, he stresses the need to think about vertical relationships for organisations and second, within that he points out that vertical relationship have to be managed in *two dimensions* determining AC i.e., differentiation and integration.³⁷⁴

Hereby, *differentiation* means the “differences across organisational subunits that arise as a consequence of their local adaptation to unit-specific tasks and environments”. Furthermore, “differentiated and diverse organisational subunits can recognize and engage in a wider search for new opportunities when environmental conditions change”.³⁷⁵

Integration “is the ‘quality of the state of collaboration that exists among departments that are required to achieve unity of effort by the demands of the environment’”.³⁷⁶ “Integration not only requires the alignment of interests (*cooperation*), but also the alignment of actions (*coordination*)”.³⁷⁷ AC is “their capacity to respond in a coordinated and cooperative manner to changes in exchange conditions”.³⁷⁸

What can we learn from network about AC and strategy?

Networks are necessary to built AC especially when addressing a complex issue such as climate change which cannot be addressed alone. Then companies should think about networks they can build to solve this problem i.e., strategic alliances with competitors to establish new technologies and spread costs and risks.

Human resource advantage

BOXALL provides another interesting view on AC from a Human Resource view and states that AC of a company is determined by its key members of the inner core.³⁷⁹ Through effec-

³⁷⁰ See CARNEY, M. (1998), p. 457f. For further advantages on networks see STABER, U. (2007), p. 4f.

³⁷¹ See CARNEY, M. (1998), p. 463f.

³⁷² CARNEY, M. (1998), p. 462.

³⁷³ CARNEY, M. (1998), p. 462.

³⁷⁴ See GULATI, A.; LAWRENCE, P. R.; PURANAM, P. (2005), pp. 415-419.

³⁷⁵ See GULATI, A.; LAWRENCE, P. R.; PURANAM, P. (2005), p. 417.

³⁷⁶ See GULATI, A.; LAWRENCE, P. R.; PURANAM, P. (2005), p. 417.

³⁷⁷ See GULATI, A.; LAWRENCE, P. R.; PURANAM, P. (2005), p. 419.

³⁷⁸ See GULATI, A.; LAWRENCE, P. R.; PURANAM, P. (2005), p. 417.

³⁷⁹ See BOXALL, P. (1998), p. 268.

tive employee and team development continuous improvement can be ensured thus leading to human resource advantage.³⁸⁰

*Identity*³⁸¹

Another interesting insight and constrain to AC is provided by BOUCHIKHI & KIMBERLY who analyses the necessity of identity within organisational change and changing environments. The authors stress the fact that changes a company aims at it sometimes in conflict with identity and if so the change is destined to fail. The author remains that companies need to alter its identity additionally to operational and strategic changes since identity is the core of a company and part of its strategic layer.

What can we learn from Human Resource Advantage and Identity?

AC is not only determined by capabilities. It is further influenced by employees within company and structures e.g., culture and identity.

Complex adaptive systems

SCHINDEHUTTE & MORRIS defines CAS as systems which are complex and adaptive (capacity to change and learn from experience). The idea of CAS is settled within complexity science and this adds a new dimension to strategic research as it discusses strategic considerations beyond “fit” and equilibrium thinking.³⁸²

PELLISSIER also discusses complexity and CAS and defines CAS as learning systems which are composed of individuals interacting with each other and thus, generating new behaviour for the overall system.³⁸³

GLOR also discusses the theory of CAS and states that the concept of adaptability is related to CAS and is the “ability to self-organize and is provided with sufficient resources to survive”.³⁸⁴

What can we learn from CAS?

The theory of CAS adds a new thinking to strategic issues as it points out that companies should think about constantly being in change not aiming at achieving fit to external conditions. This strategic dilemma is also pointed out by JARZABKOWSKI who argues that strategists need to reconcile between change and stability.³⁸⁵

Considering all these different concepts and theories related to AC it is not possible to draw one conclusion for determinants of AC. Figure 12 presents an overview of concepts applying for several levels by author. No matter if OL is antecedent, equal or separate to AC it is still related. Even if AC cannot be explained by absorptive capacity, gaining and implementing new knowledge is necessary when addressing (climate) changes. The concept mostly relating

³⁸⁰ See BOXALL, P. (1998), p. 265.

³⁸¹ See BOUCHIKHI, H.; KIMBERLY, J. R. (2003), pp. 20-23.

³⁸² SCHINDEHUTTE, M.; MORRIS, M. H. (2009), p. 253. See also VARGA, L.; ALLEN, P. M. (2006) who discusses implications of complexity science on strategy. I do not examine this paper as it provides understanding for complexity science but does not refer to AC.

³⁸³ See PELLISSIER, R. (2011), p. 152.

³⁸⁴ See GLOR, E. D. (2007), p. 34.

³⁸⁵ JARZABKOWSKI, P. (2011), p. 530.

to AC can be seen in OCC. Intuitively, this seems natural since adaptive capacity is an ability to adapt and OCC is an ability to change. Adapting to new circumstances requires change within a company so OCC can be described as AC at its best and possibly vice versa. In times of long and short-term changes a company should invest in their organisational change capacity. OCC is seen as a special dynamic capability. DC's foster change in organisations and add to the static view on capabilities needed the dynamic perspective which means raising awareness for capabilities needed to address change. Flexibility is regarded to increase AC of a company especially if a company has strategic flexibility. Intuitively this seems to be a logical consequence. If a company is able to change their strategies on every company level the company will be able to develop the right strategy to address changes as there are fewer barriers to implement new strategies. The only actions and factors determining AC are provided by MCCANN AND SUSSMAN.

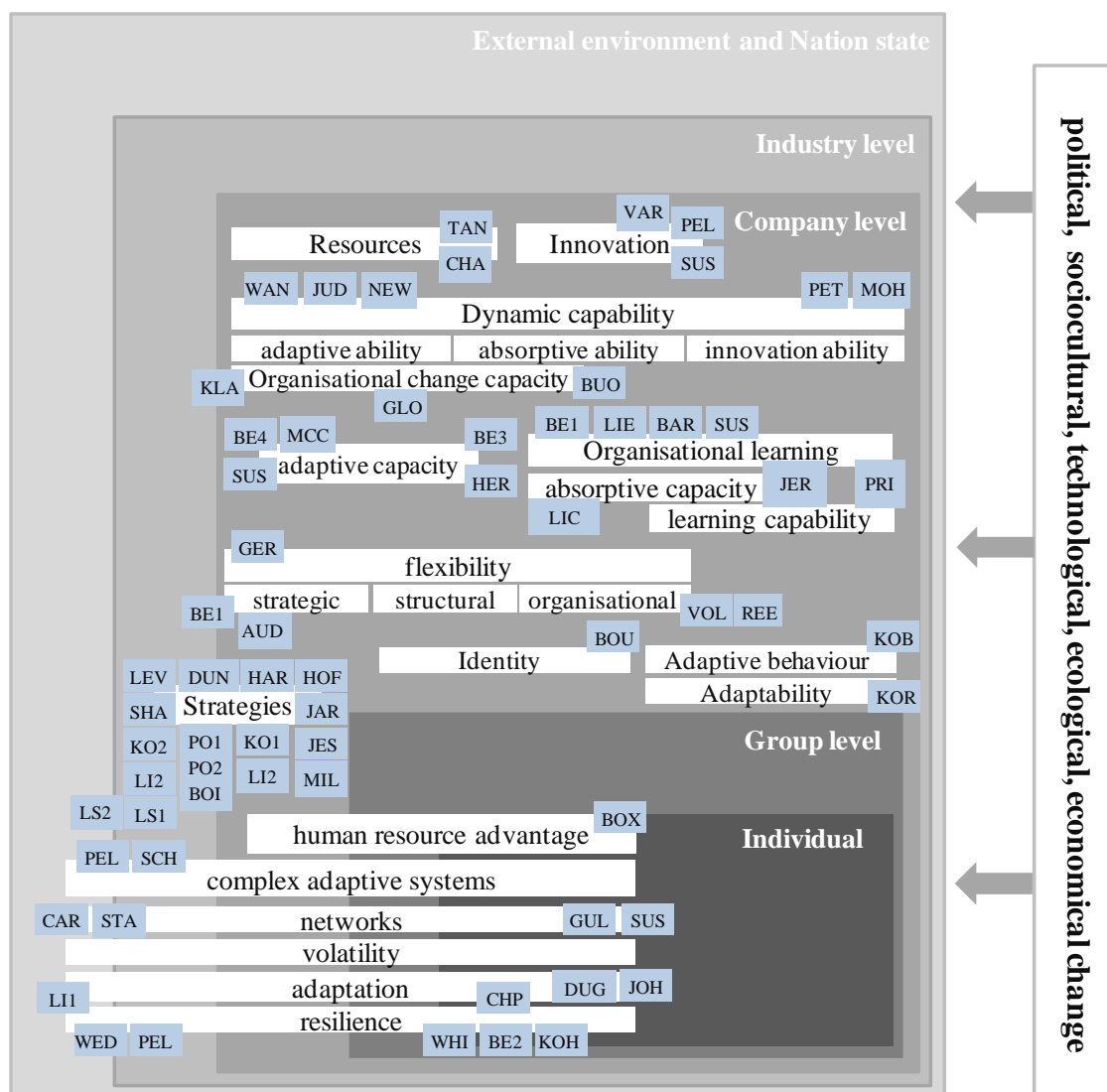


Figure 12: Summary of concepts discussed in references at various levels

(Own illustration according to LEWIN, A. Y.; WEIGELT, C. B.; EMERY, J. D. (2003) as cited in SCHINDEHUTTE, M.; MORRIS, M. H. (2009), p. 249.)

4.3 Reflecting results on research questions

Regarding the author's discipline it can be said that AC is not being discussed as exclusive concept within strategic management literature. A few authors with a strategic background refer to AC in a broader sense but do not define and examine the concept of AC. Extending the author's discipline to business and management, BEERMANN gives a definition and discusses AC as part of resilience management which is recently being discussed as a management concept. MCCANN and SUSSMAN also define and explicitly discuss the term AC. Authors discussing and aiming at explaining AC are originated within several research fields.

Surprisingly, they agree on some aspects of AC which confirms the explicit components of a definition given in chapter 2.1:

- Implicit existence is assumed
- AC exhibits endogenous character
- It is an ability to learn, use opportunities and adapt

However, most authors do not aim at explicitly examining the term AC. These authors mention the term AC with regard to other concepts such as several capabilities. Within management literature, including strategic management and organisational theory the concepts of dynamic capabilities, organisational capabilities, operational, organisational change capacity and organisational learning capability, organisational learning including absorptive capacity and continuous innovation and several more are described to improve adaptive capacity of a company. As pointed out within the last chapter 4.2.3 at the end of every concept it is not possible to draw one precise conclusion about determinants of AC. Still, some key findings are:

- (1) The challenge to build AC lies in its complexity
- (2) Concepts of capabilities are not considered exclusively and exhibit complex connections
- (3) OCC as a dynamic capability seems to be most suitable for explaining AC
- (4) Strategic flexibility was stated as a characteristic enhancing AC
- (5) The concept of OL is connected to AC
- (6) Shaping AC of a company should not be considered without thinking about new knowledge

Taking the definitions of MCCANN and SUSSMAN into account it can be said that AC is determinant by a company's learning capability, innovation capability, their network actions, their awareness of external conditions and ability to quickly implement changes taking advantages of opportunities. But still, this needs to be proved empirically. However, I argue that AC can be seen as a multidimensional and multi-faceted issue.

Furthermore, it cannot be stated that AC is antecedent to CCS. Summing up, AC is not explicitly mentioned as antecedent. Considering the meaning of AC in a broad sense it can be seen as antecedent as JOHNSTONE does. This would also confirm CHAKRAVARTY'S view on the relation between AC and implemented adaptation options. Some authors do not mention any linkage between AC and strategy. They merely consider determinants and increasing factors of AC that are also determinant factors of strategy.

Further Findings

Establishing a holistic framework of AC is due to its complexity challenging. It can be seen that it is indeed a complex issue and various concepts and theories are discussed within this context. Deriving from the theory of RBV and dynamic capabilities and assuming that AC could be a dynamic capability then AC can be regarded as antecedent to strategy.

Adaptive Capacity adds a new dimension to the discussion on adaptation. When adaptation is seen as the achieved fit to certain circumstances than adaptive capacity adds the dynamic view to adaptation process.

Theoretical implications

Even though the main research question whether AC is antecedent to climate change strategy could not be proved this papers adds to theoretical research as it points at gaps within current scientific research on adaptive capacity within strategic management literature.

Implications for practitioners

Practitioners and decision-makers within companies should consider and think about their own adaptive capacity before addressing climate change. They should think about their capabilities to foster change and actively address impacts of climate change. Building adaptive capacity in times of high complexity should be definitely integrated into their business activities.

5 Conclusion, limitations and future research

Within this work I analysed the connection between adaptive capacity and climate change strategy. I started with the theoretical background and pointed at the different research backgrounds adaptive capacity is settled. I stressed the fact that here is no common scientific view on AC within management literature and if it was contemplated within management literature it was done within organisational theory. In the second part of the theoretical background I explained strategy and strategy formulation in the context of climate change. I further pointed out that the term climate change strategy is not yet to find in classic strategic management literature.

This was followed by the development of the methodological approach. The methodology applied within this work is a systematic literature review. Analysing the 60 most relevant references it cannot be said that adaptive capacity is antecedent to climate change strategy.

Obviously, there are some *limitations* to this work. One main limitation can be seen in the different research fields making it challenging to generate one homogenous key finding out of the strong heterogeneous reference pool.

As the conducted references were highly heterogeneous an approach for synthesising references was challenging. This cross-disciplinary character of this thesis led to consideration of different concepts on a general basis. Due to the scope of this thesis an in-depth analysis and comparison of concepts could not be applied.

Moreover, most discussed concepts lack of empirical research as some of them are still emerging and are being discussed intensively within the last years e.g., dynamic capabilities.

Methodological limitations can be seen in developing a deductive coding sheet. Considering the heterogeneity this coding sheet might be seen as too rigid. Within the scope of this work and based on the characteristics of a systematic review I decided on certain databases. As a result conducted search results were limited. Grey literature which is often referred to provide new and current scientific findings was therefore not integrated.

Based on these facts *future research* can be seen in further and in-depth analysis of different concepts to understand how these concepts can contribute to adaptive capacity. It would be interesting to view dimensions of AC based on these different discussed capabilities and to examine them empirically. It might also be interesting to assess other capabilities, maybe a set of capabilities with regard to AC. Therefore in-depth research is needed to clearly distinguish between these concepts before establishing empirical research.

Also the topic of climate change strategy needs further research to be able to relate AC to strategic management and prove that empirically. Additionally, it would be interesting for future research to set adaptive capacity within a dynamic capability and resource-based framework.

Appendix

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A.1 Adaptive capacity in different research fields

The following table illustrates the complexity between concepts and research fields investigating in them as described within chapter 2.1.2. This table exhibits the concepts within ecology, disaster research and climate change research and some sub-research fields exemplarily. Relevant authors to the concepts are listed in the right column.

Table 15: Relationship between concepts and research fields

Research field Concept	Ecology		Disaster research	Climate change research		Authors
	Eco-systems	SES	Economic geography	Resilience research	Adaptation research	
Resilience	X	X	X	X		Holling; Gunderson; Folke; Walker; Timmermann, et al.
Vulnerability	X	X	X		X	Luers; Adger; McCarthy; Klein; Smit ; Füssel; et al.
Adaptive Capacity	X	X	X	X	X	Gallopin; Gaillard; Yohe; Tol; Smit; Walker; Adger; McCarthy; Klein; et al.

(Own illustration.)

A.2 Search results

Table 16: Search results by databases, journals and cross-search

Database	Search results	Potential Studies	Relevant Studies
EBSCO Academic Source Complete	3290	92	1
EBSCO Business Source Complete	2188	97	38
EBSCO Risk Management Reference Centre	165	0	0
ISI Web Of Science	129	5	2
Σ	5772	194	41
Search within Journals		11	7
Search within reference list		22	12
Σ		227	60

(Own illustration.)

A. 3 Selecting and limiting conducted search results

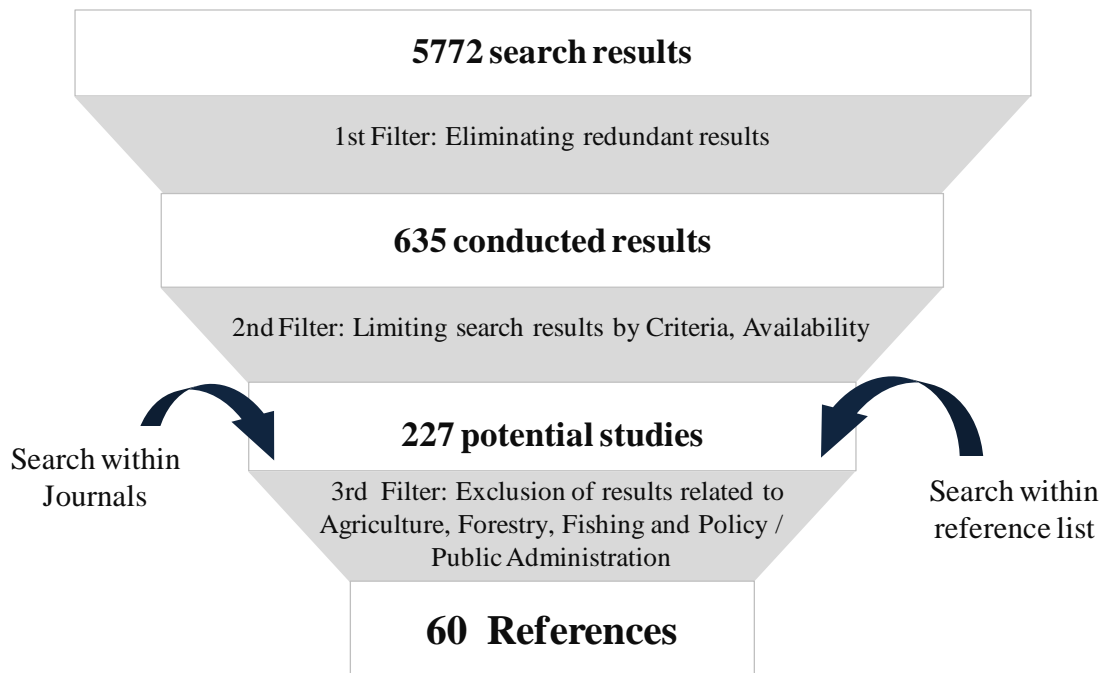


Figure 13: Selection process for limiting search results
(Own illustration.)

A. 4 Quality of reference pool

The graph shows a comparison of Journal rankings between the ISI-Impact Factor 2009, Handelsblatt and VHB Jourqual ranking. The values are percentages of the maximum value of each Ranking which means the graph shows the rankings in relation to the best assessed ranking. Included are all Journals of the 60 references where an evaluation was provided.

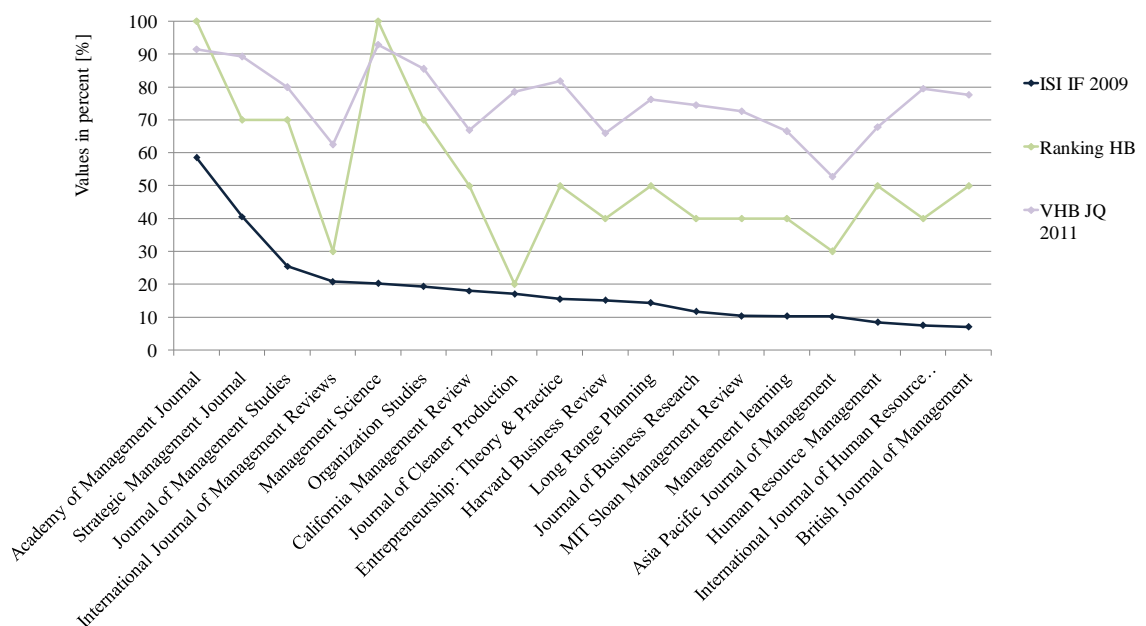


Figure 14: Ranking of Journals relative to highest possible value
(Own illustration.)

A. 5 Classification of references by impact with regard to main research questions

Table 17: Assessment of references by impact

Author	Adaptive Capacity				Strategy			Ranking
	men- tioned	Definition	Thesaurus	Characteristic	Strategy De- velopment	CCS	Decision- making	
AUD	1	0	0	0	1	0	1	D
BAR	0	0	1	0	1	0	0	D
BE1	1	0	1	1	1	0	1	C
BE2	1	1	1	0	1	1	0	A
BE3	1	1	1	1	1	1	0	A
BE4	1	1	1	1	1	1	1	A
BOI	0	0	0	0	1	1	1	D
BOU	1	0	1	0	1	0	1	C
BOX	1	0	1	1	1	0	0	C
BUO	0	0	1	1	1	0	1	D
CAR	1	1	0	1	1	0	0	D
CHA	0	1	1	1	1	0	0	D
CHP	1	1	0	1	0	0	0	D
DUG	0	0	1	1	1	0	1	D
DUN	0	0	0	0	1	1	0	D
GER	1	0	1	0	1	0	0	C
GLO	1	0	1	0	1	0	0	C
GUL	1	1	0	0	1	0	0	D
HAR	0	0	0	0	1	1	0	D
HER	1	1	0	0	1	1	0	A
HOF	0	0	0	0	1	0	1	D
JAR	1	1	1	0	1	0	1	C
JER	0	0	1	1	0	0	0	D
JES	0	0	0	0	1	1	0	D
JOH	1	1	0	0	1	1	0	A
JUD	0	1	1	1	1	0	0	D
KLA	1	1	1	1	1	0	0	C
KOB	0	0	1	0	1	0	1	D
KO1	0	0	0	0	1	1	0	D
KO2	0	0	0	0	1	0	1	D
KOR	0	0	1	1	1	0	0	D
KOH	1	0	1	0	1	1	1	B
LEV	0	0	0	0	1	1	0	D
LIC	0	0	1	1	0	0	0	D
LIE	1	0	1	1	1	0	0	C
LI1	0	0	1	0	1	0	1	D
LI2	0	0	1	1	1	1	1	D

Author	Adaptive Capacity				Strategy			Ranking
	men- tioned	Definition	Thesaurus	Characteristic	Strategy De- velopment	CCS	Decision- making	
LS1	1	0	0	0	1	1	0	D
LS2	1	1	0	1	1	1	0	A
MCC	1	1	1	1	1	0	1	C
MIL	1	0	1	0	0	1	1	B
MOH	1	0	1	1	1	0	1	C
NEW	1	1	1	1	1	0	1	C
PEL	0	0	1	1	1	0	1	D
PET	1	0	1	1	1	0	1	C
PIE	1	0	0	0	0	1	1	D
PO1	0	0	0	0	1	1	0	D
PO2	0	0	0	0	1	1	0	D
PRI	0	0	1	1	0	0	0	D
REE	1	0	1	1	1	0	0	C
SCH	0	0	1	0	1	0	0	D
SHA	0	0	1	1	1	0	1	D
STA	1	0	1	1	1	0	0	C
SUS	1	1	1	1	1	0	0	C
TAN	1	0	1	1	1	0	1	C
VAR	0	0	1	1	1	0	0	D
VOL	0	0	1	1	1	0	0	D
WAN	0	0	1	1	1	0	0	D
WED	1	0	1	1	1	1	1	B
WHI	0	0	1	1	1	1	0	D
Σ	31	15	41	33	53	21	24	

(Own illustration.)

Note: For abbreviations see Table 18.

A. 6 Classification of references by underlying theoretical concept

Table 18: Classification underlying theoretical concept and school thoughts

Author	Abb.	Author's discipline	Concept	Theoretical background	Trigger (focus)	Other concepts
AUDIA	AUD	Business; Organizational behavior	strategic persistence	Organizational inertia	radical Change	organizational learning, inertia
BARNETT	BAR	Management, Organization Studies	Organizational learning	Organizational learning, Evolutionary Theory	changing environment	Organizational learning
BEAUCHAMP-AKATOVA	BE1	Management, Technology & Policy / Safety Science group	Organizational learning from diversity	Organizational learning	environmental change	Continuous innovation, strategic flexibility, AHP for decision-making, Stakeholder
BEERMANN	BE2	Business, Environmental Studies	Resilience	Resilience Management	Climate change, external shocks	Exposure, Sensitivity, capabilities
BERKHOUT (2004)	BE3	Natural Sciences, Environmental Science	Organizational adaptation	Organization Management, Organizational learning	Climate change	Vulnerability, Adaptive capacity, organizational capabilities
BERKHOUT (2006)	BE4	Natural Sciences, Environmental Science	Organizational adaptation	Management, Organizational learning, contingency theory	Climate Change	Vulnerability, Adaptive capacity, Sensitivity, dynamic capabilities
BOIRAL	BOI	Business, Environmental Management	Proactive response	Strategic Management	global warming	Strategies
BOUCHIKI	BOU	Strategy, Management	Identity	Change Management	environmental change	-
BOXALL	BOX	Management, Employment Relations	Human Resource Advantage	RBV	industry life cycle, crisis, shocks	-
BUONO	BUO	Management, Social Science	Organizational Change Capacity	Change Management	environmental change + uncertainty	-
CARNEY	CAR	Management	Production Networks	Organization Theory, Networks	-	Adaptability, Organizational Capabilities
CHAN	CHA	Management, Marketing	NRVF	Strategic Management	Change through transition	Capabilities
CHAPIN	CHP	Biology	Ecosystem Stewardship	Strategy	Environmental uncertainty	

Author	Abb.	Author's discipline	Concept	Theoretical background	Trigger (focus)	Other concepts
DUGAL	DUG	Insurance, Strategic Management	Environmental Volatility	Contingency theory, RBV	environmental change	process-based resource oriented view, adaptive capability, configurational approach
DUNN	DUN	Management, Energy & Climate Strategy	Climate Change Strategy	Strategic Management	Climate Change	-
GERWIN	GER	Systems & Computer Engineering	Adaptive response, flexibility	Strategic Management	environmental uncertainty	-
GLOR	GLO	Innovation & Entrepreneurship	Organizational Capacity to adapt	Change Management	complexity	Self-organization, adaptive systems, organization pattern
GULATI	GUL	Management	Adaptive Capacity	Networks	Task-environment	Integration, Differentiation
HART	Har	Strategy, Environmental Management	Strategy	Strategic Management		-
HERTIN	HER	Science & Technology, Policy	adaptation, adaptive behaviour	Institutional approach	new pressures, Climate change	internal capabilities, adaptive capacity, vulnerability
HOFFMAN	HOF	Business, Sustainable Enterprises	Strategic response	Strategic Management	market shift, CC	-
JARZARBKOWSKI	JAR	Management, Strategy	Strategy in Practice	Social theories	change	Giddens, Bourdieu
JEREZ-GOMEZ	JER	Business, Organization	Organizational learning capability	Organizational learning	dynamic markets	knowledge
JESWANI	JES	Management, Environmental Strategy	Strategic Response	Strategic Management	Climate Change	-
JOHNSTONE	JOH	Climate Impacts, Environmental Management	Business response	Adaptation	Climate Change	Adaptation, Adaptive capacity
JUDGE	JUD	Strategic Leadership	Organizational change capacity (as part of DC)	Change Management, RBV, strategic human resource Management	transition economy	dynamic capabilities, absorptive capacity, ability to adapt, organizational learning, RBV
KLARNER	KLA	Management & Organization	Organizational Change Capacity	Change Management	Changing environment	Adaptive capacity

Author	Abb.	Author's discipline	Concept	Theoretical background	Trigger (focus)	Other concepts
KOBERG	KOB	Strategic Management; Organization Management	adaptive organizational behaviour	Mintzberg Strategy	environmental uncertainty, resource scarcity	Organisational flexibility, Structure
KOLK	KO1	Economics, Accountancy, Information Management	Strategic Response	Strategic Management	Climate Change	Typology Gladwin & Walter
KOLK	KO2	Economics, Accountancy, Information Management	Strategic Response	Strategic Management	Climate Change	Typology Gladwin & Walter
KORBANGYANG	KOR	Management	Organizational adaptability competency	Contingency Theory	continuous change	dynamic capability, adaptive, agile and flexible organization
KORHONEN	KOH	Technology, Industrial Management	Resilience	Strategic Management	environmental change	Risk management, Sustainable Management
LEVY	LEV	Management	Strategic Response	Strategic Management, RBV	Climate Change	Institutional theory, typology by Gladwin, Walter
LICHTENHALER	LIC	Management, Technology and Innovation	Absorptive Capacity	Organizational Learning	turbulent environment	Dynamic capabilities, exploration and exploitation, process-base view, learning
LIEN	LIE	Business	Organizational Development	Organization Theory	volatile markets (Technology)	Organizational learning
LINNELUECKE (2011)	LI1	Business, Strategy, organizational adaptation	Resilience	Resilience Management, Organization Management	Climate Change (EWEs)	RBV, Competency theory
LINNELUECKE (2010)	LI2	Business, Strategy, organizational adaptation	Business Response	Strategic Management, Adaptation	Climate Change (EWEs)	Firm relocation
LISO	LS1	Building & Infrastructure	Business response	Strategic management	Climate change	-
LISO (2006)	LS2	Building & Infrastructure	Risk management	Strategic management	Climate change	-
MCCANN	MCC	Business	Agility, Resiliency	Human Resource Management	turbulent environments	Adaptive Capacity, Vulnerability,
MILLS	MIL	Energy, Environmental Technologies	Business response	Risk Management, Strategic Management	Climate Change	Adaptation, mitigation

Author	Abb.	Author's discipline	Concept	Theoretical background	Trigger (focus)	Other concepts
MOHRMAN	MOH	Management, Organization Studies, HRM	Capabilities (Innovation, Quick Implementation, lateral)	Contingency Theory (DC)	rough times	dynamic capabilities, knowledge
NEWBY	NEW	Entrepreneurship & innovation	Operating and dynamic capabilities	Strategic Management/ Product Planning	endogenous change	absorptive capacity, adaptive ability, learning
PELLISIER	PEL	Business, Management	Resilience	Management	rapid change, complexity	Quantum thinking, CAS
PETERAF	PET	Business; Corporate Strategy; Dynamic capabilities	managerial discretion and internal fit	Contingency Theory	regulatory constraint; changing environmental conditions	dynamic managerial capabilities; adaptive organizational change
PIELKE	PIE	Environmental Studies	adaptation	-	Climate Change	Decision-making
PORTER	PO1	Management	Strategic response	Strategic Management	-	-
PORTER	PO2	Management	Strategic response	Strategic Management	-	-
PRIETO	PRI	Business, Management, Market Research	Learning Capability	Organizational learning	continuous change, dynamism	absorptive capacity, business performance
REED	REE	Management, Social & Political research	Organizational flexibility	Contingency theory	economic and political change	strategic flexibility
SCHINDEHUTTE	SCH	Management, Entrepreneurship	Strategic Entrepreneurship	Complexity Science	Complexity	CAS
SHARMA	SHA	Management, Commerce	Organizational capability	RBV, Strategic Management	changing, competitive environments	Organizational learning, innovation,
STABER	STA	Business, Economics	regional clusters	Evolutionary Theory	environmental change	Social networks
SUSSMAN	SUS	Management, Community Development	Adaptive Capacity	Organizational learning	changing environment	Organizational Capacity, Programmatic Capacity, Networks
TAN	TAN	Business, Strategy	Strategic flexibility	RBV, Organizational Learning	transition	Exploration, Exploitation, Organizational Capability, strategic adaptability
VARGA	VAR	Management	Organizational strategy, innovation and evolution	Evolutionary theory	changing circumstances	Exploration, Complexity science, Stability /Fit

Author	Abb.	Author's discipline	Concept	Theoretical background	Trigger (focus)	Other concepts
VOLBERDA	VOL	Strategic Management	Organizational Flexibility	Strategic Management/ Planning	environmental turbulence	Adaptive (manoeuvring) capacity
WANG	WAN	Entrepreneurship & innovation	Absorptive capacity	Organizational Learning	Changing environments	Dynamic capabilities; Knowledge management; Learning processes
WEDAWATTA	WED	Disaster Management, Built environment	Resilience	Resilience Management	EWEs	Vulnerability, Adaptive Capacity
WHITEMAN	WHI	Management, Business & Society	organizational resilience	Resilience Management.	shock	Flexibility

(Own illustration.)

The dimension driver of change is included in here as different concepts emerged in different research areas to explain different paces of change e.g., unanticipated, incremental, rapid change or others. More focus should be put to these different drivers of change. Clearly, climate change can happen at a slow pace and incremental such as resource scarcity but it can also happen shortly caused by shocks e.g., ewe's.

A. 7 Descriptions and codes by reference

		1
Name	Audia	
First Name	Pino G.	
Title	The paradox of success: an archival and a laboratory study of strategic persistence following radical environmental change	
Year	2000	
Co-Authors	Locke, Edwin A.; Smith, Ken G.	
Type of Article	Research Paper	
Published by	Academy of Management	
Initiated by	University	
Ref.-ID	4602	
Ref.-type	Journal article	
Journal	Academy of Management Journal	
Volume	43	
Issue	5	
pages	837-853	
Level of examination	Industry	
Country of origin	UK	
Subject	Business, Management	
Industry sector	Transport, Storage and Communication	
Country	-	
Continent	-	
Ranking		
ISI-Factor	6.438	
VHB JQ2	A+	
Handelsblatt	1	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND business	
Abstract	An archival study of the airline and trucking industries over a ten-year period and a laboratory study revealed that greater past success led to greater strategic persistence after a radical environmental change, and such persistence induced performance declines. The laboratory study also demonstrated that dysfunctional persistence is due to greater satisfaction with past performance, more confidence in the correctness of current strategies, higher goals and self-efficacy, and less seeking of information from critics.	

Code	Segment	page
	The idea that the psychological processes of organizational decision makers mediate strategic rigidity has not gone unrecognized (Hambrick & Finkelstein, 1987; Staw & Ross, 1987)	838
Aim of article	The question is: How do managers deal with these competing forces? After a period of success, do they still have the ability to recognize when it is time to change? Or is the pressure toward persistence created by past success so strong that it blinds them to early signals that past strategies may fail? We addressed these questions in two studies. In the first study, we examined the airline and trucking industries in the United States over a ten-year period surrounding a discrete and radical environmental change, a deregulation.	?
	This study adds to previous research in two important ways. First, although previous research has established that past success leads to strategic persistence (Boeker, 1997; Lant et al., 1992; Meyer, Coes, & Brooks, 1993; Miller & Chen, 1994), it has not examined this relationship in the context of a discrete and radical environmental change.	837
	However, no study to date has examined the actual psychological processes that underlie strategic persistence. Our second study was an attempt to fill this gap in the literature.	838

Adaptive capacity		
	Being open to information and advice from critics seems to be an effective way to increase one's adaptive capacity.	850
Definition	-	
Thesaurus	Why does success foster persistence? [...] organizations tend to repeat actions that are associated with positive outcomes (Cyert & March, 1963; Prahalad & Bettis, 1986). [...] they all rest on an assumption that persistence stems from the thinking processes of strategic decision makers.	838
Characteristics	Under conditions of environmental stability, persistence can be highly advantageous. It facilitates the development of competencies that have proven valuable in the	838
	past, increases efficiency and quality and, as a consequence, builds legitimacy with external stakeholders (Hannan & Freeman, 1984). Persistence also facilitates learning because in the absence of change, cause-effect relationships are clearer-cut (e.g., Levine, 1971). Furthermore, persistence reduces risks, both economic and social, stemming from low cohesion (Shaw, 1976), discouragement (Bandura, 1986), or distrust (Hollander & Julian, 1969)	839
Adaptation	-	
Strategy		
Strategy development	Previous research has shown that past organizational success leads to strategic persistence—a tendency for firms to stick with strategies that have worked in the past (e.g., Lant, Milliken, & Batra, 1992; Miller & Chen, 1994)	837
Climate change strategy	-	
Relevance for decision-making	They have suggested that success decreases information seeking and that less seeking of information reduces the ability of managers to recognize environmental changes (e.g., Miller & Chen, 1994).	839
	individual psychological processes and behaviours of organizational decision makers, a causal link often overlooked in previous research on inertia.	839
Business relevance	To ensure alignment with the new environmental context, organizations must anticipate or detect such changes and initiate strategic transformations.	837
Miscellaneous		
Results	For both industries, results indicate that the greater the performance over the five years prior to deregulation, the more organizations persisted with the past strategies in the five years following the deregulation	844
	Results also reveal that the greater the strategic persistence after deregulation, the greater the decline in performance after deregulation, though this effect was only of borderline significance in the trucking industry	844
	In both industries, size increased persistence and led to greater drops in performance after the deregulation	844
	past success had a significant effect on strategic persistence [...] thus confirming Hypothesis 2a	847
	This research identifies an intriguing pattern that we call the paradox of success. The paradox lies in the fact that the very success that organizations strive to achieve plants the seeds of their possible future decline.	847
	Such success-persistence-success cycles, however, become self destructive when radical external changes impose the need to use new strategies	849
	Our research addresses this gap by pointing to a path that is an alternative or, at least, a complementary path to inertia, a path that links organizational success to strategic rigidity through a well-identified set of psychological processes present in strategic decision makers.	850
Criticism / Limits	One limitation pertains to the generalizability of the findings of study 1. Because we focused on two industries that underwent discrete and radical environmental changes, it is unclear whether our findings apply to industries undergoing different kinds of shifts.	851
	One should also be cautious in generalizing the findings of study 2 to executives	851
Other important facts	Yet, surprisingly, an evolving literature suggests that managers often do not respond to environmental signals that indicate the need for strategic change	837
	In a study of 450 California hospitals over a period of 11 years, Meyer, Goes, and Brooks (1993) found that high performance led to fewer strategic reorientations.	838
	They have suggested that success decreases information seeking and that less seeking of information reduces the ability of managers to recognize environmental changes (e.g., Miller & Chen, 1994).	839
	Together, these findings are relevant to the literature on organizational inertia. Typically, organizations' lack of responsiveness to radical environmental changes has been seen as stemming from constraints that emanate from organizational structures, institutional pressures, organizational ideologies, investments in specialized assets, and so forth (e.g., Hannan & Freeman, 1989)	850

Further research investigations	Future research could try to identify the individual skills that act as antidotes. Alternatively, their invulnerability might stem from the effective use of organizational processes such as executive turnover and board monitoring.	850
	Clearly, future research should try to replicate the paradox of success with other kinds of participants.	851

		2
Name	Barnett	
First Name	William P.	
Title	An evolutionary model of organizational performance	
Year	1994	
Co-Authors	Greve, Heinrich R.; Park, Douglas Y.	
Type of Article	Research Paper	
Published by	John Wiley & Sons, Inc.	
Initiated by	University	
Ref.-ID	4683	
Ref.-type	Journal article	
Journal	Strategic Management Journal	
Volume	15	
Issue	-	
pages	11-28	
Level of examination	Organization	
Country of origin	USA	
Subject	Management, Business, Organization	
Industry sector	Financial intermediation	
Country	USA	
Continent	-	
Ranking		
ISI-Factor	4.464	
VHB JQ2	A	
Handelsblatt	0.7	
Source	Journal	
Search term	Searched within Journal	
Abstract	Organizations vary in how well they perform. This can be due to differences in their strategic positions and to differences in their competitive abilities. We propose an evolutionary model in which there is a trade-off between these two sources of advantage. In a naive evolutionary model, competition triggers both selection and learning--leaving organizations with the capabilities to perform better. However, managers often buffer their organizations from the disciplining forces of selection by seeking out positional advantages in the market. We argue that when this is done using multiunit structures, market position improves but organizational learning is retarded. Consistent with this view, we find that after controlling for selection, single-unit organizations benefit today from being exposed historically to competition--evidence of learning--while large, multiunit organizations do not. Multiunit organizations instead benefit from mutual forbearance, a positional advantage. The findings come from a dynamic analysis of takeovers and performance among retail banks in Illinois. Implications for the study of strategic evolution are discussed.	
Code	Segment	page
Aim of article	-	
Adaptive capacity		
Definition	-	
	Consequently, an organization that faces competition is more likely to refine current routines or to make innovations	12
	If the criteria for success change after an organization has learned, then the organization may perform poorly by doing well what it has learned—the so-called 'competency trap' (Levitt and March, 1988)	13
Thesaurus	Under this assumption, natural selection weeds out mediocre performers until we are left ultimately with the same happy result that we would get with adaptive learning refer to this as the naive evolutionary model. where whether by learning or selection, organizations that endure competition will be more capable and better performing.	13f.
	Such thinking also appears implicitly in some work, where selection or learning leads to greater competitive abilities among surviving organizations (Lippman and Rumelt, 1982; Klepper and Graddy, 1990)	14

	In the naive evolutionary model, organizations learn in response to environmental pressures	14
	In short, with the rise of multiunit organization, evolution leads to the survival of the weak (Barnett and Freeman, 1994)	14
	Here, we extend this thinking to the process of organizational learning. We argue that by pursuing the positional advantages of the multiunit, multimarket organization, managers reduce the ability of organizations to learn in three ways. First, the more that an organization's strategy reduces competitive pressure, the less its units will be prompted to improve their practices.	14
	Second, when organizations grow into a multimarket, multiunit strategy and structure, they constrain their adaptability. This argument usually surprises strategy researchers, who typically accept the maxim that growing into a differentiated structure allows greater adaptation (Lawrence and Lorsch, 1967)	15
Characteristics	-	
Adaptation	-	
Strategy		
	(This idea usually is qualified to predict only that the relatively most fit strategies will survive—see Alchian, 1950; and Nelson and Winter, 1982.)	14
Strategy development	But what about strategy? We know that managers facing competition and the risk of failure do not limit their choice set to "learn or die". Competition triggers strategic behaviour by managers.	14
	New research in the area of organizational ecology suggests that this strategic choice can cause the evolutionary process to backfire.	14
	The basic idea is that organizational size and structure protect firms from the forces of selection. This makes it both more likely that they will survive, and less likely that their weakest units will be eliminated by natural selection.	14
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	-	
Miscellaneous		
	Our findings also speak to the general issue of strategic change. Often strategies are compared according to their mean levels of performance.	25
Results	However, this does not mean that a change from one to the other strategy is without consequence. To the contrary, the sources of performance were far different for the two strategies: branch systems were less likely to learn, more likely to gain from.	25
	Consequently, a change from one to the other strategy would mean a complete change in the sources of strategic advantage, and so a change in the kinds of issues that effective management must consider. For strategic managers, this approach suggests that less attention be paid to making lists of particular capabilities. Instead, the strategic manner should attempt to manage the Darwinian process. For example, organizations sometimes purposefully generate competition internally. To the extent that such measures create the context for the generation of competencies, they do so without the risk of ultimate failure that comes with relying on the discipline of "real" competition	26
Criticism / Limits	-	
Other important facts	-	
Further research investigations	-	

Name	Beauchamp-Akatova	
First Name	Elena	
Title	Towards integrated decision-making for adaptive learning: evaluation of systems as fit for purpose	
Year	2009	
Co-Authors	-	
Type of Article	Research Paper	
Published by	Routledge	
Initiated by	University (Safety Science Group, Delft University of Technology)	
Ref.-ID	4729	
Ref.-type	Journal article	
Journal	Journal of Risk Research	
Volume	12	
Issue	3,4	
pages	361-373	
Level of examination	Organization	
Country of origin	Netherlands	
Subject	Business, Organization, Social Sciences	
Industry sector	Transport, Storage and Communication	
Country	-	
Continent	-	
Ranking		
ISI-Factor	0.569	
VHB JQ2	-	
Handelsblatt	-	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND business	
Abstract	We focus on 'adaptive learning' for the resolution of conflicts between safety and efficiency in performance, and between design and operational flexibility, thereby increasing adaptive capacity. Safety cannot be improved by applying check lists alone. Balanced, safe performance is managing diversity rather than achieving consistency. Organizational learning is increasingly important for industry in its adaptation to change, but should be seen as both stakeholder- and process-based. Organizations fail to learn when inherent traditional characteristics do not allow for the correct formulation of problems. Transformation in the learning process takes place when participants understand their own and others' benefits and losses. If learning is the conceptualization of a holistic approach, then the focus should be on the integration of knowledge from diverse backgrounds. Special attention is drawn to Analytic Hierarchy Process (AHP) methodology as a potential tool in order to extend existing frames of interpretation, where all voices can be heard.	
Code	Segment	page
Aim of article	This paper is, in part, an attempt to develop the concept of organizational learning as applied to the aviation industry [...], to explore an area of research which in our view has not yet received enough attention: namely, how can we learn from diversity (internal, external or methodological) in order to achieve balanced performance for a company operating within a network, and in a changing environment?	361
Adaptive capacity		
Definition	no direct definition --> just mentioned as sth. which will increase through learning; "Consequently, within the CI concept, OL may be seen both as a process for sustaining and optimizing existing operational practices in order to increase operational effectiveness, and as a process for supporting the augmentation of the adaptive capacity of a system through the better interpretation of external or environmental factors which drive change, and also for assisting in the setting of new goals."	363
Thesaurus	Organizational Learning (OL) has become increasingly important for industry as it adapts to changes in the political and economic environments, to changing regulatory requirements, to changing technologies and to new organizational models (e.g. Wahlström et al. 2005).	362

	Furthermore, we argue that managing the variety or diversity of processes, in differing contexts, requires a holistic approach to learning as a contributing factor, to balance strategic flexibility and operational effectiveness in a changing environment.	362
	Learning is a bridge between the 'world-as-imagined' (design) and the world-as experienced (situated action), where diversity may be a source of innovative problem-solving by combining different types of knowledge (experience-based, specific or pro-active) --> leading to change and innovative practices	362
	According to Boer and Gertsen (2003), a special form of learning process, namely, Continuous Innovation (CI) is '... the planned, organized and systematic process of ongoing, incremental and company-wide change of existing practices aimed at improving company performance'.	362
	strategic flexibility (the capability to develop new market approaches, processes, competencies, organizational and management systems which provide for the satisfaction of tomorrow's customers)	362
Characteristics	Consequently, within the CI concept, OL may be seen both as a process for sustaining and optimizing existing operational practices in order to increase operational effectiveness, and as a process for supporting the augmentation of the adaptive capacity	363
	Connection CI and OL: Since the CI concept is about using all the innovative potential in an organization in order to continuously improve company performance through learning (Boer and Gertsen 2003), we argue that in order to provide 'learning leading to action', it is important to pay attention to the 'questioning of existing organizational policies' before taking decisions about change(s).	365
	Systems requirements for Organizational Learning include the following principle stages: (1) supporting the integration of Operational Learning (Know-How) and Conceptual Learning (Know-Why); (2) measuring the organizational challenges which underlie assumptions, or values or procedures for attempting change; (3) maintaining Integrated Organizational Memory (both shared and integrated models).	370
Adaptation	We argue that organizations as adaptive systems may fail to learn when the characteristics inherent in traditional decision support systems do not allow either for feedback loops at a variety of levels or for the introduction of environmental variables in problem-solving.	363
Strategy		
	Learning, which leads to change, is not only acquired knowledge and/or direct experience, but according to Pedler and Boutall (1992), is the process of reflecting on, and questioning of, organizational policies and the reframing of strategic problems.	364
Strategy development	AHP can help in conducting an integrated analysis of explicit objectives expressed by different stakeholders as well as ideal criteria for long-term airline company development. Subsequently, it would be possible to build further models in order to define and select the best strategies with a view to avoiding undesirable changes in safety or quality levels while making commercial decisions.	368
	A company in a networked and changing environment strives to reconcile two objectives – to ensure the survival of adaptive plans and also to admit environmental change and future progress. This reconciliation is to be seen as strategic, adaptive planning and thus as a process of learning and development.	370
Climate change strategy	-	
Relevance for decision-making	The decision-making process might then be seen as an evaluation of consequences for different alternatives, given the plurality of individual and group goals. On the other hand, the decision-making process also generates answers on how to modify the system and how to provide dynamic stability at the same time.	363
	In our view, transformation in the learning process may take place within decision-making when continuous feedback loops are integrated.	363
	AHP used as decision-making tool: within this example 2 factors included: human factors and company's capacity ; focus on organizational level	365f.
Business relevance	Organizational learning is increasingly important for industry in its adaptation to change, but should be seen as both stakeholder- and process-based.	361
Miscellaneous		
Results	-	
Criticism / Limits	This is, relatively speaking, simple to set up and do. However, learning for change is more difficult and complex, because it involves learning by adapting to new processes (in an unregulated, relatively poorly understood environment). In order to learn in such an environment (in the context of any open socio-technical system), we need continuously to address how to create and maintain Integrated Organizational Memory.	372
Other important facts	An aviation system is a complex multi-actor system within an inter-organizational network. When different functional groups are affiliated to multiple organizations, communication is complex due to relatively high cognitive and cultural differences, geographic distances, diverse and often conflicting interests, and manifold interdependent relationships (Hauptman and Hirji 1999).	361
Further research investigations	-	

Name	Beermann
First Name	Marina
Title	Linking corporate climate adaptation strategies with resilience thinking
Year	2011
Co-Authors	-
Type of Article	Research paper
Published by	-
Initiated by	University (University of Oldenburg)
Ref.-ID	4706
Ref.-type	Journal article
Journal	Journal of Cleaner Production
Volume	19
Issue	8
pages	836-842
Level of examination	Organization
Country of origin	Germany
Subject	Management, Business, Environmental
Industry sector	Manufacturing
Country	Germany
Continent	Europe
Ranking	
ISI-Factor	1.876
VHB JQ2	C
Handelsblatt	0.2
Source	Google Scholar
Search term	Searched within reference list

Abstract Within modern society, business organizations have a co-evolutionary relationship with society and ecosystems. Business organizations face highly diverse risks which they have to recognize, reflect on and handle. Climate change and its impacts clarify the need for managing overall system risk. Research has shown that climate vulnerability of business organizations in the German food industry is characterized by impacts that, in particular, affect business organizations indirectly. Indirect climate change caused impacts are complex, uncertain and characterized by a high degree of unpredictability. They focus on the derived social, ecological, economic and cultural consequences of the direct physical impacts from a worldwide perspective. This paper shows that introducing resilience thinking helps to identify strategic risks and opportunities coping with climate change caused impacts in sense of corporate climate adaptation strategies. Furthermore, it is shown from a strategic management perspective that mitigation is a profound element of long term adaptation strategies.

Code	Segment	page
	This paper shows that introducing resilience thinking helps to identify strategic risks and opportunities coping with climate change caused impacts in sense of corporate climate adaptation strategies.	836
Aim of article	Furthermore, it is shown from a strategic management perspective that mitigation is a profound element of long term adaptation strategies.	836
	This paper discusses the results of exposure and sensitivity towards climate change.	837

Adaptive capacity

	The management's attitude towards changes in general is a key factor for coping with climate change impacts successfully.	840
	The resilience idea indicates that the system's design has to be pro-actively changed in advance of turbulences or shocks. Criteria for a resilient system's design can be building feedback mechanisms, diversity (Levin et al., 1998) as well as redundancies, flexible structures, modularity and buffering capacities (Miller and Page, 2007).	840
	"A resilient organization can improve its system-resilience by means of the adaptive capacity, which encompasses all those capabilities that can deal with crises, disruptions or external shifts" (Günther)	840

	The author's focus on internal capabilities of a business organization dealing with external shocks and discontinuities	840
	Considering that coping with impacts caused by climate change necessitates pro-active and innovative coping, clarifies the passive character of adaptive capacity according to Resilient Organizations	840
Definition	The adaptive capacity according to Resilient Organizations (2007) is understood as "the measure of the culture and dynamics of an organization that allow it to make decisions in a timely and appropriate manner both in day-to-day business and also in crises."	840
Thesaurus	-	
Characteristics	-	
	"Whereas mitigation refers to actions that reduce exposure to change, e.g. through regulation, location or technological shifts, adaptation on the contrary refers to the adjustments that population takes in response to current or predicted change" (Nelson et al., 2007).	837
Adaptation	Corporate incentives for developing and implementing of adaptation strategies can cover following aspects: - Part of risk or crisis management - Saving costs due to pro-active risk preparations and measurements - Development of new products (e.g. technological innovations) and therewith gaining new market sales	837
	The vulnerability assessment ends with the development of one or more adaptation strategies for the business organization as a whole or for certain business fields or processes. After analyzing and sampling of information the key element is the assessment of the overall vulnerability	840
Strategy		
Climate change strategy	-	
Strategy development	Coping successfully with impacts caused by climate change necessitates more than traditional strategic management instruments	837
	According to Schumpeter (1934) successful strategy building and long term viability of organizations need creative solutions. Building adaptive capacity also means creating new business models, products, ways of planning and producing and so forth.	840
Relevance for decision-making	-	
	Indirect climate change caused impacts are complex, uncertain and characterized by a high degree of unpredictability	836
	However, our knowledge about the elements that promote resilience and practical information how business organizations can cope with increasing complexity and dynamics due to impacts caused by climate change are still rather limited (Smit and Wandel, 2006; Smithers and Smit, 1997; Toman, 1998)	836
	It will be shown that especially indirect impacts caused by climate change are difficult to handle. Indirect impacts are complex, uncertain and characterized by a high degree of unpredictability	836
	Consequently, business organizations play important roles speeding up climate change on the one hand and on the other buffering impacts caused by climate change	837
	Indirect impacts can be also understood as imported impacts of global climate change for a certain business organization or sector.	839
Business relevance	From a business perspective interviewees identified changes in transport conditions, rise in production insecurities, risks for the supply chain management or changes in demand as relevant indirect impacts.	839
	The following sector encompassing potential chances caused by climate change were identified: - Need for intensified innovations: Keeping the market position - Acquisition of new business markets according to product, service, technological and institutional innovations - Preferential treatment of certain sectors due to changing weather conditions, e.g. certain agricultural sectors - Building new business cooperation's with countries that need technologies or services that have not been needed before, e.g. renewable energy, water management systems	839
	The following potential risks were identified: - Changes in demand: Changes in societal and cultural preferences, e.g. eating habits, demand for certified products (e.g. carbon foot print) - Economic exposure of regional firms: Increase in foreign competitors, anticipation of higher world prices for resources (e.g. energy, raw materials) - Increase in production insecurities: Collapse of up- and downstream production stages, insecurities concerning planning processes and logistics, long term outsourcing of production lines - Fluctuations in product quality and quantity: Rise in prices, time and quality concerning delivery problems, rise in production prices (e.g. due to higher energy and transaction costs)	839

Miscellaneous		
Results	-	
Criticism / Limits	-	
	Concepts of vulnerability and resilience are being more and more used in business management for analyzing and finding appropriate ways to cope with these impacts (Günther et al., 2007; Armitage, 2006; Sheffi, 2005; Starr et al., 2003).	836
	The resilience concept originates from ecosystem science. The ecologists Odum (1971) and Holling (1973) described how ecosystems by means of homeostatic mechanism organize themselves in order to reach an ecological balance.	836
Other important facts	Implementing mitigation strategies from a business management perspective can cover several motivation patterns, e.g.: <ul style="list-style-type: none"> - Saving energy and therewith costs (e.g. in operational processes, trading emissions) - Improving the environmental performance (e.g. against the background of sustainability reports, reputation and legitimation) - Development of new energy-saving products or production processes and therewith gaining market benefits - Advantages of pioneer position (e.g. being prepared for new regulations) 	837
	Further research is needed for identifying factors that promote the adaptive capacity of business organizations in the food industry considering the concept of resilience as analytical category	840
Further research investigations	Further research needs to be done to analyze potential synergies between these approaches.	6
	Finding appropriate ways of integrating resilience thinking as analytical category for building corporate adaptation strategies, current resilience management concepts mainly lack of practical information and a low level of applicability	6

		5
Name	Berkhout	
First Name	F.	
Title	Business and Climate Change: Measuring and Enhancing Adaptive Capacity	
Year	2004	
Co-Authors	Hertin, J.; Nigel, A.	
Type of Article	Technical Report	
Published by	Tyndall Centre	
Initiated by	Tyndall Research Centre	
Ref.-ID	4607	
Ref.-type	Website	
Journal	Climatic Change	
Volume	11	
Issue	-	
pages	-	
Level of examination	Organization	
Country of origin	Netherlands	
Subject	Environmental Sciences; Natural Science	
Industry sector	Construction, (Water Management)	
Country	UK	
Continent	Europe	
Ranking		
ISI-Factor	-	
HB JQ2	-	
Handelsblatt	-	
Source	Google Scholar	
Search term	Searched within reference list	
Abstract	The project worked intensively with nine companies in the house-building and water services sectors over a two-year period. Through a series of interviews and workshops the project developed a picture of companies' vulnerability, their knowledge of climate-related risks and their attitudes to these risks, the adaptation measures available to the companies, and their capacity to carry out alternative adaptation strategies. The main outputs of the project are: a learning-based model of adaptation; an approach for assessing the adaptive capacity of organisations; and (developed in association with a complementary project) a decision-making tool to help businesses make sense of and respond to a changing climate.	
Code	Segment	Page
	The paper sets out a framework for analysing adaptation to the direct and indirect impacts of climate change in business organisations with new evidence presented from empirical research into adaptation in nine case-study companies	1
Aim of article	The central aim of the research is to explore which factors determine adaptation to climate change on the basis of what we know about the ways in which organisations learn, innovate and change in response to conventional regulatory and market pressures	2
Adaptive capacity		
	Organisations, such as business firms, are the primary socio-economic units within which processes of adaptation will take place, even if their vulnerability and adaptive capacity will be profoundly influenced by the market and regulatory contexts within which they operate	2
Definition	-	
Thesaurus	The work has mainly been concerned with understanding how organisations learn from direct experience, how they learn from others, and how they develop conceptual frameworks for interpreting that experience (Levitt and March, 1988: 319)	3

	Learning involves the encoding in organisational routines of lessons learnt from experience and leads to changes in organisational behaviour – a process often referred to as adaptation (cf. Chakravarthy, 1982; Aldrich and Auster, 1986; March, 1991; Staber and Sydow, 2002)	3
	Routines are modified or adapted when the organisation experiences novel situations for which appropriate procedures have not yet been developed, when existing routines prove to be unsuccessful, or when alternative routines which promise greater advantages are discovered internally or externally (Gavetti and Levinthal, 2000)	3
	operational capabilities are those that enable a firm to carry out its routine business activities; and dynamic capabilities that enable a firm to change and adapt operational activities (Collis, 1994).	4
	Dynamic capabilities involve the ability to integrate, build and reconfigure internal and external competencies and routines (Teece et al., 1997)	4
	Zollo and Winter (2002: 340) define a dynamic capability as ‘...a learned and stable pattern of collective activity through which an organisation systematically generates and modifies its operating routines in pursuit of improved effectiveness.’	4
	This process has been observed in practice and modelled using the idea of learning curves, but is not much further discussed. Processes of search involve an exploration of alternative ways of responding to novel situations, and are seen as being constitutive of dynamic capabilities.	5
	This is a creative process involving internal and external scanning for relevant experience and knowledge that can be applied and recombined in an effort to generate a variety of adaptation options (Nonaka, 1994)	5
	Organisational learning can be seen as a cycle which begins with a stimulus leading to the generation of variation through experimentation and search, proceeds with a process of internal selection, articulation and codification, followed by the replication and enactment of new routines across the organisation, finally returning to the beginning of a new cycle of innovation by virtue of a new stimulus	5
Characteristics	Dynamic capabilities: Whether a firm is an early or a late adapter will depend on its dynamic capabilities, i.e. the ability to modify and adapt organisational routines and behaviours in response to external drivers of change. This finding emerged particularly strongly in the house-building sector, where the only firm that had started to think about climate impacts was also leading on other industry issues (e.g. partnering and sustainable construction)	151
	Organisational culture: Organisational culture appeared to be a key determinant of the way in which a firm responded to new risks posed by climate change. Water companies, with their more conservative business cultures, tended to respond more cautiously to potential climate impacts than commercial property developers who operate in a dynamic and competitive market. In general, we find that adaptation measures reflect and affirm, rather than undermine a company’s attitude and approach to risk management.	151
	A substantial academic literature has developed on adaptation and related concepts such as sensitivity, vulnerability, resilience and adaptive capacity (Easterling et al., 1993; Burton, 1996; Downing et al., 1996; Yohe et al., 1996; Glantz, 1998; Tol et al., 1998; Schneider et al., 2000; McCarthy et al., 2001; Adger, 2001)	1
	Routines represent much of an organisation’s on-going activity, which come to be challenged and adjusted in processes of learning. We further argue that many of the characteristic signals and mechanisms that play a role in market-induced organisational learning and change are attenuated with regard to adaptations that may be made in response to climate change stimuli	2
Adaptation	Core competencies: Companies can be expected to search for and adopt adaptation measures in areas that match their core competencies. Interviewees tended to suggest adaptation measures that the company would be able to design and implement within the framework of the knowledge base of the organisation. Adaptation measures were framed in terms of current business practices and drivers.	16
	Core business: If a climate change is seen to have a significant physical impact on the core business, companies tend to engage with the issue on a technical level. For instance, water companies will be inclined to adopt engineering solutions to respond to an imbalance between supply and demand due to climate change. Where only a marginal activity is affected, risk-sharing or risk-shifting options such as insurance or outsourcing often appeared more appealing. The degree of exposure to climate-related risks therefore influences the mode of adaptation	16
Strategy		
Strategy development	-	
	Taken together, these factors shape what we characterise as an organisation’s adaptation strategy	151
Climate change strategy	Working with case study companies, we identified four alternative adaptation strategies: 1. Wait and see: A strategy of deferral, based on scepticism or uncertainty about the possible impacts of climate change and about the benefits of adaptation.	151
	Risk assessment and options appraisal: A strategy of appraising options in preparation for adaptation of organisational routines	151

	Bearing and managing risks: A strategy of handling risks and opportunities arising from climate impacts employing organisational resources and capabilities	151
	Sharing and shifting risks: A strategy of seeking to 'externalise' risks associated with climate impacts through insurance and collaboration.	151
Relevance for decision-making	-	
Business relevance	-	
Miscellaneous		
	It argues that adaptation to climate change has many similarities with processes of organisational learning. The paper suggests that business organisations face a number of obstacles in learning how to adapt to climate change impacts, especially in relation to the weakness and ambiguity of signals about climate change and the uncertainty about benefits flowing from adaptation measures	1
	Organisations rarely adapt 'autonomously', since their adaptive behaviour is influenced by policy and market conditions, and draws on resources external to the organisation. The paper identifies four adaptation strategies that pattern organisational adaptive behaviour.	1
	The performance of the housing and water companies was found to be strongly related to climatic conditions. Companies in both sectors build and manage large infrastructures that are exposed to weather and climate.	10
	In other words, the sensitivity of companies is a composite of climate and non-climate factors that may be specific in their impacts on the organisation	10
	As a result, climate sensitivity was not perceived or treated differently from more conventional drivers of technological, market or regulatory change. Managers found it difficult to rank sensitivities to climatic change relative to their sensitivities to more conventional changes, and therefore to place these novel risks into their existing risk assessment frameworks, whether tacit and formal	12
	While most interviewees were aware that the global climate is expected to change, direct signals of climate change experienced in businesses activities and performance were rare and tended to be hard to interpret	12
	Other house builders reported a decreasing number of frost days bringing fewer work stoppages during winter and increasing attention to the risk of skin cancer due to outside working	12
	In the housing sector these signals were usually perceived as being specific, rather than being interpreted as indications of a wider phenomenon of climate change	12
	Indirect signalling occurred more frequently, especially in the water sector where companies were required to adjust long-term (25 year)	13
Results	Several housing developers reported more stringent planning restrictions in flood plains by the EA, but they were unsure whether this was due to higher flood risks as a result of climatic change, or due to increased awareness as a result of recent flooding events	13
	ge had been with mitigation issues, especially the energy efficiency of buildings. For many managers, a changing climate had remained a hypothetical notion towards which Government policy was directed, not an everyday reality about which they would need to make independent, commercially-based decisions	13
	We found that the market (customers, competitors and creditors) was the source of few indirect signals to adapt, although the housing companies saw them as major potential future drivers of adaptation	13
	We found that different functions across all case study companies were able to identify adaptation measures appropriate to their climate sensitivity	14
	Our research suggested four modes of adaptation (cf Hertin et al., 2002): <ul style="list-style-type: none"> • changes to the commercial strategy of the firm (commercial adaptation); • changes to technologies used to provide products or services (technological adaptation); • changes related to financial management systems (financial adaptation); and • changes in data gathering and monitoring trends (information and monitoring of climate stimuli and search processes for adaptation measures) 	14
	For instance, the technical directors of housing companies were able to identify a range of practical measures to prevent storm damage on construction sites	14
	Companies tended to draw upon the repertoire of responses already open to them, rather than invest in research and development to identify new options. In otherwords, the adaptation space will be an envelope of known measures	15
	We found only limited evidence of the articulation of climate change adaptation in terms of new routines codified as blueprints, decision-support tools, targets and so on	15
	In the housing sector, company D had recently begun to integrate climate considerations into the design of planting schemes for 'green spaces'	15

	Our case study research identified four factors that appeared to shape patterns of an organisation's approach to adaptation:	16
	Many of the housing companies we studied fell in the first category, while the water companies were following strategies 2 and 3	17
	Organisations match their available routines to the situations they face. Learning takes place, either by virtue of repetition (learning by doing) or - when a novel situation is confronted - through a process of search and planned modification of routines to suit the new situation	18
	This analysis leads us to conclude that the way in which firms respond to pressures from climate change is in many ways similar to conventional market, technological or regulatory adaptation	18
	This is because average climatic conditions change only slowly compared with learning cycles typical in organisations, and because examples of more extreme events will often not be related to climate change with any certainty	18
	We have also found that adaptive behaviour is patterned by specific internal resources and external conditions, and is therefore difficult to predict and subject to generalisations	19
Criticism / Limits	-	
Other important facts	An understanding of this process is important because it will allow analysts and decision makers to assess vulnerabilities and potential future damages; explore the more subtle indirect effects of climate change; and provide knowledge for better choices about how to achieve efficient, effective and equitable adaptation	1
	Most of the companies in the sample were regarded as market leaders in their approach to innovation and several had demonstrated substantial interest in environmental issues, as evidenced through, for instance, environmental awards	6
Further research investigations	Further research in this area could aim to explore whether the patterns of adaptive behaviour found in house-building and water companies apply equally to other economic sectors and to public sector organisations. It would also be interesting to assess whether the expected strengthening of climate change signals would remove some of the barriers to organisational adaptation identified in this paper	19

		6
Name	Berkhout	
First Name	Frans	
Title	Learning to adapt: organisational adaptation to climate change impacts	
Year	2006	
Co-Authors	Hertin, Julia; Gann, David M.	
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Published by	Springer	
Initiated by	Institute for Environmental Studies	
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Ref.-type	Journal article	
Journal	Climatic Change	
Volume	78	
Issue	1	
pages	135-156	
Level of examination	Organization	
Country of origin	Netherlands	
Subject	Environmental Sciences; Natural Science	
Industry sector	Construction, (Water Management)	
Country	UK	
Continent	Europe	
Ranking		
ISI-Factor	3.635	
VHB JQ2	-	
Handelsblatt	-	
Source	Google Scholar	
Search term	Searched within reference list	
Abstract	<p>Analysis of human adaptation to climate change should be based on realistic models of adaptive behaviour at the level of organisations and individuals. The paper sets out a framework for analysing adaptation to the direct and indirect impacts of climate change in business organisations with new evidence presented from empirical research into adaptation in nine case-study companies. It argues that adaptation to climate change has many similarities with processes of organisational learning. The paper suggests that business organisations face a number of obstacles in learning how to adapt to climate change impacts, especially in relation to the weakness and ambiguity of signals about climate change and the uncertainty about benefits flowing from adaptation measures. Organisations rarely adapt 'autonomously', since their adaptive behaviour is influenced by policy and market conditions, and draws on resources external to the organisation. The paper identifies four adaptation strategies that pattern organisational adaptive behaviour.</p>	
Code	Segment	Page
	Through a series of interviews and workshops the project developed a picture of companies' vulnerability, their knowledge of climate-related risks and their attitudes to these risks, the adaptation measures available to the companies, and their capacity to carry out alternative adaptation strategies.	2
Aim of article	The main outputs of the project are: a learning-based model of adaptation; an approach for assessing the adaptive capacity of organisations; and (developed in association with a complementary project) a decision-making tool to help businesses make sense of and respond to a changing climate	2
	Our aim has been to take a more organisation-centred view of adaptation that looks at processes of adaptation in business firms. We believe that issues of perception, sensemaking, interpretation and problem-solving are central to determining whether and how adaptation amongst social agents takes place. Our objective was to develop the means to influence the adaptive strategies of organisations.	2
Adaptive capacity		

	The project was not able to make progress on a set of adaptive capacity indicators for companies. The main reason is that adaptive capacity appears to be a property of an organisation, as well as the social and economic context in which it is operating. These contexts are often quite specific, so that defining and constructing indicators of adaptive capacity at the organisational level that are in some senses comparable and useful may not be possible.	3
	This has implications for how adaptation processes are likely to unfold, and draws attention to the importance of the adaptive capacity that is available to organisations by virtue of their own resources and the context within which it operates.	9
	An intervening factor – adaptive capacity – will determine the extent to which companies become aware of their vulnerability, and can evaluate, make decisions about and implement adaptation measures, whether in anticipation or in response to climate change impacts.	14
	The capacity to adapt will depend not only on factors internal to an organisation, but also the broader institutional, market and cultural context within which they operate.	23
Definition	A substantial academic literature has been developed on adaptation and related concepts such as sensitivity, vulnerability, resilience and adaptive capacity (Burton, 1996; Downing et al., 1996; Yohe et al., 1996; Glantz, 1998; Tol et al., 1998; Schneider, 2000; IPCC, 2001).	6
	What are the attributes of the adaptive capacity of specific communities, organisations and resources? What motivates adaptation processes? What factors determine processes of adaptation?	6
	Signalling & Interpretation: The research identified a range of reasons why the evidence from experience may fail to be recognised and interpreted as significant. These include scarcity of evidence, blindness to evidence, and uncertainty in assessing the relevance of evidence.	8
	Experimentation: Processes of search involve an exploration of alternative ways of responding to novel situations, and are seen as being constitutive of dynamic capabilities. This is a creative process involving internal and external scanning for relevant experience and knowledge that can be applied and recombined in an effort to generate a variety of adaptation options (Nonaka, 1994).	8
	Knowledge articulation and codification: This selection process is succeeded by a higher level cognitive effort in which modified routines and their performance implications are codified in manuals, blueprints, decision-support tools, software, targets and so on. This process of codification is necessary because it enables the transmission of the adaptation and its justification throughout the organisation and the replication and enactment change processes.	9
Thesaurus	As a result, adaptive capacity from an organisational, micro-level perspective is mainly related to the capacity to shift risk to other actors (e.g. from the developer to the land owner; from the insurer to the home owner).	15
	The main reason is that adaptive capacity appears to be a property of an organisation, as well as the social and economic context in which it is operating	4
	Theories of organisational learning draw on behavioural studies of organisations and have traditionally been concerned with the question of why and how organisations change their behaviour. The work has mainly been concerned with understanding how organisations learn from direct experience, how they learn from others, and how they develop conceptual frameworks for interpreting that experience (Levitt and March, 1988: 319). Learning involves the encoding in organisational routines of lessons learnt from experience and leads to changes in organisational behaviour - a process often referred to as adaptation (cf. Chakravarthy, 1982; Aldrich and Auster, 1986; March, 1991; Staber and Sydow, 2002)	7
	In these situations, routines are adapted incrementally in response to feedback about outcomes (Steinbruner, 1974). However, this process of modification requires special effort on the part of the organisation and a specific set of capabilities.	7
	Two types of capabilities are commonly referred to: operational capabilities are those that enable a firm to carry out its routine business activities; and dynamic capabilities that enable a firm to change and adapt operational activities (Collis, 1994).	7
Characteristics	Organisational learning can be seen as a cycle which begins with a stimulus leading to the generation of variation through experimentation and search, proceeds with a process of internal selection, articulation and codification, followed by replication and adoption of the adaptation across the organisation, finally returning to the beginning of a new cycle of innovation by virtue of a new stimulus.	9
	Adaptive capacity related to an awareness of the need to adapt, the ability to make knowledgebased decisions about measures and the capacity to implement the adaptation process.	14
	A thorough and flexible risk management process.	14
	Strong in-house technical expertise facilitates the process of evaluating, choosing and implementing technological adaptation options. It reduces reliance on specialist consultants.	15
	Effective internal communication is important to raise awareness within the company about potential impacts of climate change.	15
Adaptation	The process of adaptation is also likely to have distinct features. Opportunities for 'trail-and-error' adaptation may be relevant to sectors like agriculture and water services in which climate sensitivity translates	10

	fairly directly into organisational performance.	
	However, progress towards developing theoretical understandings of adaptation has been slow (Kasperson et al., 1995; Kelly and Adger, 2000; Folke et al., 2002).	6
Strategy		
	allow companies to explore their sensitivity and adaptive capacity in relation to climate change, thereby providing an overall assessment of vulnerability to enable companies to take steps to become less vulnerable, either by reducing their sensitivity or by increasing their adaptive capacity to support the decisions about the relative risks and opportunities associated with different anticipatory and reactive strategies.	25
	The large majority of interviewees suggested that climate change adaptations would not be principally different from many other strategic choices that companies currently face	14
	This recognition allows us to examine adaptive capacity using examples of past adaptations to changing market conditions or new technical knowledge.	14
	The concept of an “adaptation space” has been identified to describe the area where clusters of adaptation options relevant to an organization are available and how these interact with the formulation of an adaptation strategy	21
	Climate-related adaptations will be made against the background of a number of other, perhaps more important, drivers of change: changing technologies, shifting consumer expectations, emergence of new competitors, changing regulations and so on.	22
Strategy development	Rather than identifying the overall ‘optimal’ adaptation option, the management should tool take account of the specific capabilities of the firm and its market and regulatory context.	23
	Stage 1: Risk and Opportunity Analysis aims to identify the business areas that could be affected by climate change - both directly and indirectly. It involves a preliminary review of the key issues, which may be followed up by a detailed analysis to produce a prioritised list of key impacts.	27
	Stage 2: Strategy development formulates an overall strategic approach towards climate change adaptation. It set out strategies to respond to the risks and opportunities posed by each key impact.	27
	Stage 3: The Implementation phase develops an action plan for the strategies developed in stage 2 and supports its implementation.	27
	Stage 4: The Integration phase aims to identify internal processes and routines in which climate change concerns should be integrated.	27
Climate change strategy	Climate change may force firms to do things differently in the future, but so do new competitors, new technologies, changing exchange rates or tighter regulation. As a result, adaptation will often involve actions comparable to ‘normal’ market adaptation. At the same time, climate change adaptation has a number of specific features, especially the long term nature of change and the need for a particular type of information	25f.
Relevance for decision-making	A climate change management tool should not attempt to radically alter internal decision-making processes, but it should help to integrate climate change into existing procedures.	25
	The attention of decision-makers should be drawn to indirect as well as direct effects from climate change	23
Business relevance	There were a small number of issues about which some companies are very aware, e.g. increased flood risk, higher skin cancer risk for the workforce on building sites and a possible increase in the demand for air conditioning.	11
	Our analysis takes the perspective of the organisation, and views ‘climate stimuli’ as one among many stimuli for change that the organisation will face.	6
Miscellaneous		
	Organisations respond to signals about actual and potential impacts of climate change on their operations in the context of many other more powerful signals about their market environments. Organisations attempt to apply existing ‘routines’ (ways of doing things, technologies, norms and so on) in response to these signals	3
Results	This learning model of adaptation was applied in the development of a decision-making framework for companies. This provides for a 4-stage process for companies to follow: a risk and opportunity analysis; strategy setting; implementation; and integration.	3
	In contrast to what might be expected, adaptive capacity did not appear to be predominantly an internal feature of organisations – at least in the case of UK house building firms. Instead, it seems to be based on a combination of both internal capabilities of firms and on their external relationships.	14
	Overall, it emerges that actors at the beginning of the supply chain (suppliers, developers, architects etc) will have a strong influence on the future vulnerability and adaptive capacity of the housing stock, but they will only experience a small part of the impact of climate change.	15

	Those actors situated towards the end of the supply chain (owners, occupiers, household insurers, mortgage lenders and so on) tend to be more exposed to climate change while exerting less control over technological choices that affect the vulnerability to climate change. This is particularly true for the speculative housing market in the UK, which produces highly standardised products. This mismatch in the incentive structure could lead to a situation where the level of adaptation is considerably lower than would be desirable from the point of view of society.	15
	We know about climate change as a result of scientific research, funded and promoted over many years by governments. The impacts of climate change will affect whole societies and regions, and government programmes have been at the forefront of assessing these impacts and devising possible responses end of the chain (owners, occupiers, insurers, mortgage lenders etc) are more exposed to the risks.	29f.
Criticism / Limits	-	
Other important facts	In general, organisations operating in stable environments are assumed to focus on efficiency gains through improvements of operating routines, while in less stable environments greater investments are made in exploration and the discovery of new ways of doing things (March, 1991; Benner and Tushman, 2003).	8
	climate change impacts will be extremely heterogeneous	26
	ADAPT research has confirmed that knowledge about climate change varies considerably between sectors and companies.	27
Further research investigations	-	

		7
Name	Boiral	
First Name	Olivier	
Title	Global warming: should companies adopt a proactive strategy?	
Year	2006	
Co-Authors	-	
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Published by	Elsevier Science Publishing	
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Ref.-ID	4609	
Ref.-type	Journal article	
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Volume	39	
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pages	315-330	
Level of examination	Organization	
Country of origin	Canada	
Subject	Management, Business	
Industry sector	Cross-sector	
Country	Japan	
Continent	Asia	
Ranking		
ISI-Factor	1.58	
VHB JQ2	B	
Handelsblatt	0.5	
Source	Journal	
Search term	Searched within Journal	
Abstract	<p>Many managers are at a loss concerning the strategy they should to adopt to deal with global warming and the requirements enforced by the Kyoto Protocol. This article proposes a global approach to anticipate the possible impacts of global warming on organisations and to explore policies and measures that managers can implement to cope with this issue. The frame analysis proposed sheds light on the relevance of proactive or more wait-and-see responses to global warming while stressing the importance of promoting environmental intelligence and other preliminary measures before deciding what strategy to adopt. The article also calls into question monolithic and static views of climate change strategies and illustrates, through examples, the actions that managers can take to put the Kyoto Protocol on their agendas.</p>	
Code	Segment	Page
Aim of article	The frame analysis proposed sheds light on the relevance of proactive or more wait-and-see responses to global warming while stressing the importance of promoting environmental intelligence and other preliminary measures before deciding what strategy to adopt	315
	Why are some companies like ST Micoelectronics adopting proactive strategies regarding global warming, and what is the value of such strategies?	315
Adaptive capacity		
Definition	-	
Thesaurus	-	
Characteristics	-	
Adaptation	These organisational responses depend on contingent factors, particularly the expected economic impact of GHG reductions, the political and regulatory context surrounding global warming, scientific or technical aspects and social pressures	318
Strategy		

	Being proactive supposes implementing actions “intended to cause changes, rather than just reacting to change”	321
	The trade-off between proactive and wait-and-see approaches is an ongoing process that must be reassessed continuously	325
	global warming remains a complex issue, requiring foresight and vision from managers rather than reactions to existing constraints.	318
	Uncertainties about how global warming will impact on corporate activities mirror the controversies surrounding the Kyoto Protocol and related public policies. Most of these controversies revolve around economic issues	318
Strategy development	The benefits or costs associated with GHG reduction depend on many factors, such as the sector of activity, distinctions between preventive and palliative actions, environmental objectives and firm capabilities, which can vary significantly from one case to another. 11 For example, Wagner and Schaltegger have pointed out that the relationship over time between environmental performance and economic success is not linear and depends on many factors, including corporate management systems, technologies and processes operated, firm size, industry market structure, return expectations, et al.	319
Climate change strategy	Hoffman stresses that companies can benefit from voluntary GHG reductions through seven aspects: operational improvement, anticipating and influencing climate change regulations, accessing new sources of capital, improving risk management, elevating corporate reputation, identifying new market opportunities and enhancing human resource management	318
Relevance for decision-making	-	
	According to Hoffman, the economic and strategic impacts of climate change will depend mostly on capital asset management, the global competitiveness of countries, the anticipation of institutional changes stemming from the Kyoto Protocol and the ability of the market to take advantage of the emergence of new opportunities related to climate change policies	318
Business relevance	This win-win perspective is often called the Porter Hypothesis, named after the author who was one of the first to question the traditional postulate of the negative links between environmental initiatives and competitiveness. 10 For Porter, an organisational response to environmental pressure entails innovative efforts to improve processes, use inputs more efficiently and find new outlets for production by-products	319
	The aforementioned uncertainties about global warming initiatives do not necessarily call into question the relevance and importance of organisational commitment to GHG reduction. Nevertheless, these uncertainties require a systematic and ongoing effort to monitor information and environmental changes likely to affect organisational policy regarding global warming	324
Miscellaneous		
	Most of these studies urge managers to adopt a proactive response to environmental issues, taking for granted that this response will be rewarded	321
	Adopting a proactive response may also reduce some financial risks. First, environmental issues are increasingly used as criteria to evaluate performance on financial markets and assess good governance	321
	Second, banks and insurance companies are increasingly taking these issues into account	321
Results	Consequently, many companies tend to maintain the status quo and not react as long as they are not obliged to do so. This reactive response is more likely to occur in industries in which the renewal cycle for infrastructure and production facilities is slow	323
	As an example, some companies fear that early efforts to cut GHG will not be fully recognised at a later stage if they have to make more investments. In regions such as Canada, where the GHG trading system is not already in place, the wait-and-see attitude seems understandable. In this case, companies delaying their environmental investments can reasonably expect to take better advantage of their GHG reduction once such a market is in place	323
	They also raise the issue of timing. Indeed, the benefits or costs of a proactive strategy may remain unclear, even for organisations intent on promoting environmental intelligence on global warming. In this case, managers may find it more rational economically to adopt a wait-and-see policy first	324
Criticism / Limits	-	
	In March 2006, ST Microelectronics, one of the leading semiconductor manufacturers, announced a commitment to reduce its US greenhouse gas emissions (GHG) by 50 per cent between 2000 and 2010. A recipient of many environmental awards, especially for efforts to reduce GHG emissions	315
Other important facts	These commitments are fundamental to company management philosophy and have resulted in many innovative initiatives: integrating environmental criteria in the performance evaluation of factory directors; encouraging use of public transportation and car-pooling among employees; implementing reforestation programmes in Texas, Morocco and Australia to offset the company’s remaining GHG emissions, et al	315

Until now, relatively few organisations have implemented a climate change policy. According to a study conducted in 2004 among managers of the top 500 companies in the world, 80 per cent of respondents considered that their organisation would be affected by the consequences of global warming and the ensuing regulations.	316
Examples of organisations actively supporting the Kyoto Protocol and having significantly committed themselves to reducing their GHG, such as ST Microelectronics, BP, Shell and DuPont, show that organisational responses to climate change are not necessarily passive or negative. Moreover, the fact that just a few short years ago some of these organisations were very reluctant to back the Kyoto Protocol illustrates the importance of putting defensive and passive attitudes into context rather than considering them as static.	316
In fact, the proactive strategy assumes that the reinforcement of institutional pressures to combat global warming and the benefits that should stem from doing so can both be predicted with some certainty	323
Further research investigations	-

Name	Bouchikhi
First Name	Hamid
Title	Escaping the identity trap
Year	2003
Co-Authors	Kimberly, John R.
Type of Article	Research Paper
Published by	Sloan Management Review
Initiated by	University
Ref.-ID	4699
Ref.-type	Journal article
Journal	MIT Sloan Management Review
Volume	44
Issue	3
pages	20-26
Level of examination	Organization
Country of origin	France
Subject	Management, Strategy
Industry sector	Cross-sector
Country	France
Continent	Europe
Ranking	
ISI-Factor	1.141
VHB JQ2	D
Handelsblatt	0.4
Source	BSC
Search term	"adaptive capacity" AND environment* change AND strategy AND business

Abstract To stay competitive, many companies attempt radical transformation by adopting a brand-new business model, entering a different industry, merging with another firm or deploying a new global strategy. Often, these efforts fail. The management literature offers many explanations, but none of them recognize that an organization's fundamental identity can be the primary constraint on its adaptive capacity. As they seek to change, companies can work on three separate, intimately connected levels: operations, strategy and identity. The authors identified two scenarios of identity change: evolutionary and revolutionary. The transformation of a company's identity is easier when key stakeholders understand the need for radical change of the organization but feel relatively secure about the continuity of its business. Managers who want to help their organizations achieve substantive, but peaceful, change need to be aware of, and anticipate the possibility of, identity obsolescence

Code	Segment	page
Aim of article	Organizations, like people, have essential natures defined by their formative experiences, their beliefs, their knowledge bases and their core competences. Attempts at change that are in conflict with this core identity are often doomed to failure. Managers can learn to recognize such conflicts and initiate Identity change to make their companies more adaptive.	20
Adaptive capacity		
	While none of those explanations is wrong, per se, none recognizes that an organization's fundamental identity can be the primary constraint on its adaptive capacity.	20
Definition	no definition --> adaptive capacity used as a characteristic of a company, it seems to be sth. a company has or not	
Thesaurus	Identity: And, just as the identity of individuals may come to be anchored in some combination of gender, nationality, profession, social group, life style, educational achievements or skills, so an organization's may be anchored in some combination of geographical place, nationality, strategy, core business, technology, knowledge base, organization design, operating philosophy or governance structure.	20
	Identity as a layer and part of strategy (see figure page 23)	23
Characteristics	-	

Adaptation	-	
Strategy		
	The dominant view of firms as flexible economic entities whose strategies can be continuously adapted to the evolving environment downplays the importance of organizational phenomena such as collective memory, values, history, politics, habits, emotions — as well as identity.	21
Strategy development	Think of identity as an envelope within which the organization can accomplish change without threatening its perceived essence. When the envelope is too constraining or becomes irrelevant, effective strategic change is impossible until the envelope itself is redefined.	21
	A company can adapt and align its strategy with its operations without altering its identity. [...] But too many companies attempting transformation focus only on the operational and/or strategic layers, unaware of the ways identity — the organization's innermost layer — can impede change and result in inertia.	23
Climate change strategy	-	
Relevance for decision-making	As they seek to change, companies can work on three separate, intimately connected levels: operations, strategy and identity. (Sec "A Layered Model of Organizations.")	23
Business relevance	A company may explicitly articulate its identity or it may remain, as is more frequently the case, tacit and unquestioned — that is, until some event, such as a new strategy or a radical shift in the environment, makes it problematic.	21
Miscellaneous		
	Identity is powerful. As Jim Collins and Jerry Porras convincingly argue, organizations cannot endure without developing a solid core from which they can confront a changing [...] environment.	22
	Our research has led us to identify two scenarios of identity change: evolutionary and revolutionary	24
	In the evolutionary scenario, identity change is a more or less consciously sought by product of successive strategic and organizational changes over a long period of time. In other words, consistent change at the outer layers — strategy and operations — inevitably spreads to the inner layer — identity — and eventually reshapes it.	24
Results	In the revolutionary scenario, change begins at the inner layer and bursts up through the outer layers. The change process begins with a swift redefinition of the company's identity and then proceeds with realignment of strategy and operations with the newly defined identity. In this scenario, identity change is explicitly sought to enable further strategic and operational change.	24
	The process of changing identity requires: managers should pay attention to identity issues as well as to more traditional strategic and operating matters. To preempt the transformation of what was once a valuable asset into a liability, they should periodically assess the degree of fit between their company's identity and its environment, and initiate change when necessary. [...] commitment of key stakeholders to an organization's identity can weigh heavily in strategic decisions	25
Criticism / Limits	-	
Other important facts	-	
Further research investigations	-	

		9
Name	Boxall	
First Name	Peter	
Title	Achieving competitive advantage through human resource strategy: towards a theory of industry dynamics	
Year	1998	
Co-Authors	-	
Type of Article	Theoretical Paper	
Published by	Elsevier Science Publishing Company, Inc.	
Initiated by	University (University of Auckland)	
Ref.-ID	4680	
Ref.-type	Journal article	
Journal	Human Resource Management Review	
Volume	8	
Issue	3	
pages	265	
Level of examination	-	
Country of origin	New Zealand	
Subject	Management, Strategy, HRM	
Industry sector	-	
Country	-	
Continent	-	
Ranking		
ISI-Factor	-	
VHB JQ2	C	
Handelsblatt	0.1	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND business	
Abstract	This article uses the resource-based view of the firm, along with other theoretical sources, to outline the basic elements of a theory of 'human resource advantage'. It asks the question: how can firms build and defend competitive superiority through HR strategy across the phases of the typical industry life cycle? Human resources capable of yielding sustained advantage are those which meet tests of (1) rare value, and (2) relative immobility and superior appropriability. While we can identify certain broad principles associated with human resource advantage, cycles of establishment, maturity and renewal in industries add important complexities. The article identifies situations in which we can be reasonably confident we understand the requirements for HR advantage and others where much more research is needed.	
Code	Segment	page
Aim of article	It asks the question: how can firms build and defend competitive superiority through HR strategy across the phases of the typical industry life cycle?	265
Adaptive capacity		
	Loss of key members of the inner core undermines the firm's capacity to adapt to a changing environment and to lead adaptive change in the industry, as we shall illustrate in the case of the Ford Motor Company [...]	268
	The inner core, one might say, provides the 'adaptive capacity' of the firm while the outer core provides it with 'credible operational capacity'.	268
Definition	-	
Thesaurus	Human resource advantage can be understood as the product of two key categories: the firm's human capital and its organization process advantages (Boxall 1996) [...] build human resource advantage from a superior problem-solving capability: workers and managers identify and solve more quality problems than rivals, learning faster how to reduce unit costs and improve customer satisfaction.	267
	The resource-based view of the firm inevitably drives us to make a distinction between 'core' employees	268

	who are critical to value creation and 'peripheral groups (Purcell 1996, forthcoming). In analysing a firm's workforce, it is helpful if we define an inner and outer core.	
	To gain Human Resource advantage companies need to have a strong alignment between employees and business (see Table 1 page 271) "Firms that seek HR advantage must be able to manage mutuality through superior resources and processes for aligning employee interests with those of the firm [...]. Strong mutuality provides the motivation for individuals and teams to join, stay and grow with the firm rather than one of its rivals. Employee and team development resources and processes also play a role."	269ff.
Characteristics	The inner core consists of those managers, technical specialists and strategically located workers who are responsible for valuable innovations or for successful imitation.	268
	The outer core consists of those employees, who have appropriate industry skills, with whom stable employment relations must be built if the firm is to meet its commitments to customers without process disruptions. Furthermore, these are the employees on whom the firm will depend for continuous improvement within a given strategic paradigm.	268
	From an organizational behavior perspective, the functions of the cores can be thought of as two kinds of learning: 'double loop' and 'single loop' learning respectively (Argyris & Schön 1978)	268
Adaptation	-	
Strategy		
	All firms face strategic problems. The primary problem is how to become and remain a viable player in the firm's chosen industry or sector. Various aspects of management-competitive positioning, technology and operational style, finance, HRM and so on-have a critical role to play in this.	266
Strategy development	The resource-based view of the firm is an increasingly popular perspective on strategic management which emphasises the role of internal capabilities, developed historically in firms, in explaining business outcomes (see, for example, Barney 1991; Peteraf 1993; Wernerfelt 1984).	265
	This perspective should not be taken to imply that firms are merely reactive to environmental changes beyond their control. The model is not deterministic. Firms which reach novel solutions first can often impose change costs on rivals, [...]. This implies that management matters, that more skilful management has the potential to create new competitive resources and disable the historical resources of rivals.	266
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	While change is occurring all the time, there are periods of crisis in industries, including periods of founding, and subsequent shocks caused by technological break-throughs and other traumas (Miller & Friesen 1980; D. Mueller 1997; Tushman et al. 1986).	266
Miscellaneous		
Results	The model outlined in this article does not represent a fully comprehensive theory: it constitutes some basic steps towards better theory than we have hitherto had. It argues that firms which secure ongoing viability in their industry have the potential to build human resource advantage through superior human capital and organizational processes.	283
	In a nutshell, these sources of superiority depend on the quality of interest alignment and employee development in a firm compared with industry rivals. These basic principles are complicated by the specific challenges associated with different phases of the industry life cycle.	283
Criticism / Limits	-	
Other important facts	Resources capable of yielding sustained advantage must not only be valuable and scarce but also difficult to imitate or neutralise by substitution (Barney 1991; Peteraf 1993; F. Mueller 1996; Wright et al. 1994).	269
Further research investigations	However, we need much more work on both the establishment and renewal contexts. It seems likely that clever use of personal knowledge and early alignment of interests is vital in the founding phase if small, vulnerable firms are to compete against the mature organizations which dominate the labor and capital markets in which they are struggling to become established.	284

		10
Name	Buono	
First Name	Anthony F.	
Title	Intervention and organizational change: building organizational change capacity	
Year	2010	
Co-Authors	Kerber, Kenneth W.	
Type of Article	Theoretical Paper	
Published by	EBS Review	
Initiated by	University (Department of Management, Bentley University)	
Ref.-ID	4704	
Ref.-type	Journal article	
Journal	EBS Review	
Volume	27	
Issue	-	
pages	9-21	
Level of examination	Organization	
Country of origin	USA	
Subject	Management, Organization	
Industry sector	Real estate, renting and business activities	
Country	USA	
Continent	North America	
Ranking		
ISI-Factor	-	
VHB JQ2	-	
Handelsblatt	-	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND compan*	
Abstract	<p>Although many organizations are faced with the challenge of adapting to rapidly changing, often unpredictable environments, the underlying conception of the change process remains relatively simplistic in nature. The paper explores the need for a diagnostic orientation to conceptualizing and implementing change and the concomitant challenge of building organizational change capacity. Emphasis is placed on an intervention strategy focused on the: 1) micro- (understanding and acceptance of different approaches to change; enhancing willingness and ability to change); 2) meso-(creating a change facilitative infrastructure, ensuring appropriate resources); and 3) macro-(building a facilitative culture, ongoing strategizing) levels of an organization. A brief case study is used to illustrate this approach.</p>	
Code	Segment	Page
Aim of article	-	
Adaptive capacity		
Definition	-	
	<p>Given this emphasis, it is important to differentiate change readiness in respect to the ability to implement a specific change, from change capacity – the ability of an organization to change not just once, but as a normal course of events in response to and in anticipation of internal and external shifts, constantly adapting to and anticipating changes in its environment (see, for example, Klarner, Probst and Soparnot, 2008; Myers and Stensaker, 2006; White and Linden, 2002).</p>	10
Thesaurus	<p>Change capacity is thus an ongoing capability that reflects (1) a dynamic process of continuous learning and adjustment, enabling the organization to cope with ambiguity and uncertainty, and (2) the ability to implement those changes (Klarner, et al, 2008; Staber and Sydow, 2002)</p>	10
	<p>An important first step in building organizational change capacity is to understand the nature of change and the various ways in which it can be dealt with, with the goal of enhancing the willingness and ability of organizational members to change.</p>	14
Characteristics	<p>Directed change is driven from the top of the organization and relies on authority, persuasion and compliance</p>	14

	Planned change, which has become an increasingly popular approach to change management, may arise from any level in the organization, but ultimately is sponsored by the top	14
	A very different approach to implementing change is guided changing – an emergent process that can	14
	Intervening at the Meso-level: Building a Change-Supportive Infrastructure	17
Adaptation	-	
Strategy		
Strategy development	A related macro-level factor that affects organizational change capacity involves the organization's approach to strategy. In contrast to traditional approaches to strategy, Lawler and Worley (2006) emphasize the importance of making "strategizing" the normal condition.	18
	This approach to strategy involves thinking dynamically, focusing on the future, and stringing together a series of momentary advantages, rather than attempting to achieve a sustainable competitive advantage	18
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	in literally every industry are increasingly being challenged to both respond to and anticipate continuously changing competitive, market, technological, economic and social conditions to the point where change is described as the "new normal" (Jørgensen, Owen and Neus, 2008)	9
	Although a high change capacity organization certainly requires a shared purpose to provide overall direction, strategies for achieving that shared purpose can change quickly based on scenarios involving	18
Miscellaneous		
Results	Unfortunately, organizations are all too frequently overly constrained by infrastructures, cultures and strategies that are based on needs for control and predictability rather than what is required by the rapidly changing environment. Companies and their management, however, can no longer afford to rely on ad hoc approaches to managing change that are controlled from above, in essence creating "self-sabotaging traps" that undermine their ability to effectively bring about necessary changes in their organization (cf. Edmondson, 2008; Jørgensen et al, 2008)	19
Criticism / Limits	-	
Other important facts	-	
Further research investigations	-	

		11
Name	Carney	
First Name	Mick	
Title	The competitiveness of networked production: the role of trust and asset specificity	
Year	1998	
Co-Authors	-	
Type of Article	Research Paper	
Published by	Wiley-Blackwell	
Initiated by	University	
Ref.-ID	4724	
Ref.-type	Journal article	
Journal	Journal of Management Studies	
Volume	35	
Issue	4	
pages	457-479	
Level of examination	Industry	
Country of origin	Canada	
Subject	Business; Management	
Industry sector	Manufacturing	
Country	China	
Continent	Asia	
Ranking		
ISI-Factor	2.805	
VHB JQ2	B	
Handelsblatt	0.7	
Source	BSC	
Search term	"adaptive capacity" AND "global change" AND strategy AND compan*	
Abstract	<p>The paper offers a synthesis of sociological and transactions cost economics perspectives on production networks. Sociological explanations of network effectiveness (competitiveness) stress the importance of trust, and transactions costs emphasize asset specificity. The approach here is comparative, the capabilities of networks are assessed against those of the vertically integrated, managerially coordinated hierarchy. The argument is that the competitiveness of each form derives from different organizational capabilities. Neither is inherently superior – by supporting different strategies, networks and hierarchies can co-exist. A distinction is drawn between those networks that rely on communal support and trust and those networks whose dynamism relies on individualistic and autonomous entrepreneurship. The absence of trust (or the surfeit of entrepreneurial zeal) leaves firms reliant on generic assets. Trust creates the conditions under which communities of firms can develop industry-specific assets capable of delivering real services to network firms that are unavailable through market channels. The competitiveness of a production network is a function of the value adding activities undertaken by agents and the collective responses made to external threats or disturbances. The argument is illustrated with reference to the organization of watch (timepieces) production in Hong Kong.</p>	
Code	Segment	Page
Aim of article	In the following sections a framework is developed around the dimensions of adaptability and asset specificity which permits a comparison of the relative organizational capabilities	458
Adaptive capacity		
Definition	According to Williamson (1991), two types of adaptive capacity are found in high performance systems. We shall call them entrepreneurial and coordinated adaptability respectively	462
Thesaurus	-	
Characteristics	Neoclassical markets in which utility maximizing economic agents respond independently and autonomously to parametric market signals are entrepreneurially adaptable in this sense	462
	Co-ordinated adaptability is the ability to effect realignments between large-scale dedicated or co-specialized assets (Teece, 1986) located at different stages in an industry value chain. Historically such realignments were co-ordinated within large firms.	462

Adaptation	-	
Strategy		
Strategy development	-	
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	The advantages claimed for production networks lay in their flexibility and rapid response to changing market conditions.	458
	The central problem for transaction costs economics is the management of uncertainty or organizing for unforeseen contingencies - this is essentially the problem of adaptation	462
Miscellaneous		
Results	-	
Criticism / Limits	-	
Other important facts	The argument is illustrated with reference to the organization of watch (timepieces) production in Hong Kong	457
	Vertically disaggregated and spatially concentrated production networks (networks) are seen as a viable, and often desirable, alternative to the vertically integrated hierarchically co-ordinated corporation.	457
	The critique suggests that networks are a transitory phenomenon or a temporary response to major structural changes in technology and world product markets. As managerial hierarchies learn and assimilate flexibility they will out-compete less integrated networks.	458
	In the 1970s, hierarchical organization experienced a crisis in mature western economies attributable to a series of environmental disturbances. For example, hierarchies were unable to respond quickly and in sufficient diversity to the demassification of markets which resulted in lost market share (Piore and Sabel, 1982).	459
Further research investigations	-	

		12
Name	Chan	
First Name	Ricky Y. K.	
Title	Does the natural-resource-based view of the firm apply in an emerging economy? a survey of foreign invested enterprises in china	
Year	2005	
Co-Authors	-	
Type of Article	Research Paper	
Published by	Wiley-Blackwell	
Initiated by	University	
Ref.-ID	4694	
Ref.-type	Journal article	
Journal	Journal of Management Studies	
Volume	42	
Issue	3	
pages	625-672	
Level of examination	Organization	
Country of origin	China	
Subject	Business; Environmental	
Industry sector	Cross-sector	
Country	China	
Continent	Asia	
Ranking		
ISI-Factor	2.805	
VHB JQ2	B	
Handelsblatt	0.7	
Source	BSC	
Search term	46	
Abstract	<p>This study explores whether enterprises operating in China benefit from the practice of the tenets of the natural-resource-based view of the firm (NRVF). To this end, a conceptual model is proposed that depicts the major determinants and consequences of the practice of NRVF. By and large, the survey data collected from foreign invested enterprises (FIEs) in China confirm the validity of the proposed model, and suggest that the NRVF is applicable in the world's largest and fastest-growing emerging economy. These results remind FIEs in China of the opportunities to enhance corporate environmental and financial performance through the adoption of environmental strategies. Various regression and multi-group analyses conducted in this study further reveal significant moderating influences of perceived environmental uncertainties, operating mode, and firm size on the process of achieving company-wide ecological sustainability.</p>	
Code	Segment	Page
	This study explores whether enterprises operating in China benefit from the practice of the tenets of the natural-resource-based view of the firm (NRVF). To this end, a conceptual model is proposed that depicts the major determinants and consequences of the practice of NRVF.	1
Aim of article	To fill this research gap, this study aims at proposing an integrative model to depict the major antecedents and consequences relating to the practice of NRVF.	2
	To accomplish the second objective, the study specifically addresses the following questions: (1) Do firm-specific resources lead to the emergence of organizational capabilities? (2) Do these capabilities affect the adoption of environmental strategies? (3) Does the adoption of environmental strategies lead to better corporate performance? (4) Do uncertainties that executives perceive in the natural environment moderate the process of environmental strategy adoption? (5) Will firms with different demographic and operating characteristics exhibit different degrees of effectiveness in adopting environmental strategies?	3
Adaptive capacity		

	They further maintain that such incorporation will enhance the ability of firms to deal with uncertainties at the interface between business operations and ecological issues, and help to develop competitively valuable organizational capabilities (Banerjee, 2001; Hart, 1995).	2
Definition	Sharma and Vredenburg's (1998) investigation has focused on the relationship between environmental strategies and capabilities, and between capabilities and competitive benefits	2
	It is specifically made up of seven hypotheses to delineate the major antecedents (firm-specific resources and organizational capabilities), consequences (environmental and financial performance), and moderator (perceived environmental uncertainties of the natural environment) of the adoption of environmental strategies.	4
Thesaurus	In order to grasp a better understanding of the nature of resources, it is worthwhile to distinguish between resources and organizational capabilities.	6
	In the resource-based literature, the boundary between resources and capabilities is often not clearly defined (Andersen and Kheam, 1998).	6
	whereas organizational capabilities are the capacities for a team of resources to perform some tasks or activities (Grant, 1991, pp. 118–19).	6
	On this basis, resources can be viewed as the antecedent of organizational capabilities which, in turn, can also be conceived as the main source of competitive advantages.	6
Characteristics	-	
Adaptation	-	
Strategy		
	To cope with various operating constraints resulting from increasing governmental and societal awareness of environmental degradation, proponents of the natural-resource-based view of the firm (NRVF) suggest that firms should incorporate the consideration of environmental issues into their strategic planning process (Hart, 1995; Shrivastava, 1995b)	2
Strategy development	His theory suggests that due to increasingly stringent constraints imposed by the natural environment, the firm's ability to deal with these constraints will constitute its valuable rare, and imperfectly inimitable organizational capabilities, and consequently lead to superior economic and social outcomes	4f.
	Despite their explicit reference to the resource-based literature, the aforementioned studies have devoted only scant attention to the empirical examination of the relationship between resources and the adoption of environmental strategies.	5
	In the strategic management and resource-based literature, a firm's unique bundle of resources has long been advocated as a major antecedent of its strategy (Andersen and Kheam, 1998; Grant, 1991; Johnson and Scholes, 1997).	6
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	-	
Miscellaneous		
	Recently, Sharma and Vredenburg (1998) have demonstrated that the adoption of environmental strategies will eventually lead to various competitive benefits for enterprises	34
Results	In the face of diminishing opportunities to develop value-generating capabilities in today's highly dynamic and competitive marketplace (Hart, 1995), proactive strategies to address problems inherent at the interface between the enterprise and ecological issues may represent one of the few alternatives available to sustain organizational growth	34
	This indicated that firm size did not significantly moderate the relationship between firm-specific resources (RES) and organizational capabilities (GOCAP or SOCAP). On the other hand, SIZE was found to exert a direct and positive influence on both GOCAP (model 1) and SOCAP (model 2). The findings further suggest that large firms are, in general, more competent in developing organizational capabilities than are their small counterparts	31
	This suggested that FIEs would be less inclined to deploy their organizational capabilities to develop environmental strategies if they perceived the natural environment as uncertain	25
Criticism / Limits	-	
Other important facts	-	
Further research investigations	As such, an integrative model that depicts all the major antecedents and consequences involved in environmental strategy adoption is yet to be fully developed.	2

		13
Name	Chapin	
First Name	F. S.	
Title	Ecosystem stewardship: sustainability strategies for a rapidly changing planet	
Year	2010	
Co-Authors	Carpenter, Stephen R.; Kofinas, Gary P.; Folke, Carl; Abel, Nick; Clark, William C.; Olsson, Per; Smith ,D.M.; Walker, Brian; Young, Oran R.; Berkes, Fikret; Biggs, Reinette; Grove, J.M.; Naylor, Rosamond L.; Pinkerton ,Evelyn; Steffen, Will; Swanson, Frederick J.	
Type of Article	Theoretical Paper	
Published by	Elsevier Science Publishing Company, Inc.	
Initiated by	Cooperation	
Ref.-ID	4626	
Ref.-type	Journal article	
Journal	Trends in Ecology & Evolution	
Volume	25	
Issue	4	
pages	241-249	
Level of examination	-	
Country of origin	USA	
Subject	Ecological Sciences, Biology	
Industry sector	-	
Country	-	
Continent	-	
Ranking		
ISI-Factor	-	
VHB JQ2	-	
Handelsblatt	-	
Source	ASC	
Search term	"adaptive capacity" AND climate* change AND strategy AND management	
Abstract	Ecosystem stewardship is an action-oriented framework intended to foster the social–ecological sustainability of a rapidly changing planet. Recent developments identify three strategies that make optimal use of current understanding in an environment of inevitable uncertainty and abrupt change: reducing the magnitude of, and exposure and sensitivity to, known stresses; focusing on proactive policies that shape change; and avoiding or escaping unsustainable social–ecological traps. As we discuss here, all social–ecological systems are vulnerable to recent and projected changes but have sources of adaptive capacity and resilience that can sustain ecosystem services and human well-being through active ecosystem stewardship.	
Codes	Segment	page
Aim of article	-	
Adaptive capacity		
Definition	Adaptive capacity: capacity of social–ecological systems, including both their human and ecological components, to respond to, create and shape variability and change in the state of the system.	241
Thesaurus	Ecosystem stewardship: a strategy to respond to and shape social–ecological systems under conditions of uncertainty and change to sustain the supply and opportunities for use of ecosystem services to support human well-being.	241
Characteristics	-	
Adaptation	-	
Strategy		

	Reduce exposure to hazards and stresses: Minimize known stresses and avoid or minimize novel hazards and stresses, Develop new institutions that minimize global-scale stresses, Manage in the context of projected changes rather than in the historical range of variability	244
	Reduce social–ecological sensitivities and adapt to adverse impacts, Sustain the capacity of ecosystems to provide multiple ecosystem services, Sustain and enhance crucial components of well-being, particularly of vulnerable segments of society, Plan sustainable development to address the tradeoffs among costs and benefits for ecosystems, multiple segments of today’s society and future generations	244
Strategy development	Ecosystem stewardship shifts the resource management philosophy from reactions to observed changes to proactive governance that shapes change for sustainability, while preparing for the unexpected	244
	Preparing for transformation, Engage stakeholders to identify dysfunctional states and raise awareness of problems, Identify thresholds, plausible alternative states, pathways and triggers, Identify the barriers to change, potential change agents and strategies to overcome barriers	246
	Building resilience of the new regime, Create incentives and foster values for stewardship in the new context, Initiate and mobilize social networks of key individuals for problem solving, Foster interactions and support of decision makers at other levels	246
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	-	
Miscellaneous		
	The specific issues that challenge ecosystem stewardship vary tremendously across the planet, so no single formula or institutional arrangement is applicable to all situations	247
Results	Recent developments identify three strategies that make optimal use of current understanding in an environment of inevitable uncertainty and abrupt change: reducing the magnitude of, and exposure and sensitivity to, known stresses; focusing on proactive policies that shape change; and avoiding or escaping unsustainable social–ecological traps.	241
	As we discuss here, all social–ecological systems are vulnerable to recent and projected changes but have sources of adaptive capacity and resilience that can sustain ecosystem services and human well-being through active ecosystem stewardship.	241
Criticism / Limits	-	
Other important facts	-	
Further research investigations	-	

		14
Name	Dugal	
First Name	Mohinder	
Title	Environmental volatility: a reassessment of the construct	
Year	2000	
Co-Authors	Gopalakrishnan, Shanthi	
Type of Article	Theoretical Paper	
Published by	Center for Advanced Studies in Management	
Initiated by	Cooperation (MBIA Insurance, Research Institute)	
Ref.-ID	4627	
Ref.-type	Journal article	
Journal	International Journal of Organizational Analysis	
Volume	8	
Issue	4	
pages	401-424	
Level of examination	Organization	
Country of origin	USA	
Subject	Management, Strategy, Organization	
Industry sector	Real Estate, Renting and business activities	
Country	-	
Continent	-	
Ranking		
ISI-Factor	-	
VHB JQ2	-	
Handelsblatt	-	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND business	
Abstract	Environmental volatility is a central construct in strategy studies. This paper argues that three factors confound the literature on volatility: asymmetry in conceptualization, asymmetry in operationalization, and lack of attention to level of analysis. These limitations inhibit the development of the concept and make much of the research on volatility non-additive. However, environments do matter and to make better sense of it we need a meta-conceptualization. To do this, the paper presents a process-based resources-oriented view of volatility that argues that the volatility experienced by the firm is largely a function of the resources it has available to meet the demands made of it. It is proposed that volatility originates from four basic resource configurations: managerial-human resources configuration, physical resources-conversion configuration, intangible resources configuration, and positional configuration. Propositions consistent with prior theories and incorporating the new resources-oriented viewpoint are presented and discussed.	
Code	Segment	page
	"However, environments do matter and to make better sense of it we need a meta-conceptualization; Paper presents a process-based resource-oriented view of volatility"	401
Aim of article	Is volatility a function of resources companies have available to meet the demands made of it?	401
	paper aims to overcome problems in developing a holistic approach: "[...] the relationship between volatility and types of strategies, and its role in strategy performance relationship, shows that volatility is still an elusive construct." --> author states that this is based 3 confounding factors: asymmetries in conceptualization, operationalization and lack of attention of level of analysis	402
Adaptive capacity		
	"Volatility is seen as a concept that arises outside the organization and affects internal working and adaptive capability of the organization" BUT also caused from inside (authors view)	401
	Organizations have varying adaptive capacities, and therefore experience volatility unevenly.	408

	Adaptive capacity decreases experienced volatility	411
Definition	no direct definition, only connection: volatility affects adaptive capability	
	Volatility: "There is little consensus on how it has been defined and measured."	402
	Management theorists: "have either used different labels to refer to the construct, or redefine it while retaining the volatility label."	402
	Burgeois defines it as: "the amount of non-systematic change encountered in the firm's task environment"	403
	Osborne et al. define it as: "the rate of change or velocity, degree of change or force, and predictability of change or directional deviation."	403
Thesaurus	The notion of volatility may be ultimately seen as a resultant state that is caused by various external and internal factors that increase the uncertainty, instability or predictability that is faced by an organizational unit.	403
	In other words, volatility is not an absolute state that all organizations experience in the same way or during the same time period.	408
	Through the RBV "volatility can be viewed as relatively tangible and disengaged. Therefore, volatility may be reflected in resources available both externally and within the organization, and is something that an organizational unit could control or manage.	410f.
	Author looks at volatility in sets of resources --> therefore he refers to different resource configurations given on specific levels within an organization "Taken together, they encompass most kinds of resources that are important to an organization." and he refers the construct to a configurational approach at different levels of an organization	412
	4 resource configurations: managerial-human resources, physical resource-conversion, intangible resources and positional configuration	412
	Managerial human-resource configuration: this configuration refers to the human resources a company has -> this is important in case of managers who define and formulate missions and goals of a company --> managers do have different competencies --> only the managers with firm and/or industry related competencies are less volatile	414
Characteristics	physical resource-conversion configuration: "includes tangible assets like plant, machinery, materials, and all capabilities that are necessary to successfully transform input resources to products and services" --> plus volatility is a function of breadth and depth, breadth is "domain of activity across the elements of the value chain"(outsourcing) while depth is "extent to which a firm has excelled in one or more of its activities, or developed core / distinctive competencies." --> "organizations that engage in a wider breadth of value-chain activities, and with greater depth, will perceive less volatility."	414f.
	intangible resources configuration: 2 types of intangible resources: (1) Internal intangible resources like intellectual property rights of trade secrets, contracts, patents, etc. (2) external intangible resources like brand, reputation, access to networks --> has to be built up on the long-term --> managing these is important --> "Organizations that have accumulated (or have access to) intangible resources will face less environmental volatility."	415f.
	positional configuration: this includes the "capacity to acquire support from aggregates and entities in its environment", e.g. "firm's relationship with its competitors and other external stakeholders" (networks) --> "Within an industry firms with established relationships will face a less volatile environment, as compared to non-networked firms."	417
Adaptation	organizations does not only observe and react / adapt --> they can create and affect environment	408
	"effective management of corporate culture enhances capacity for organizational learning and adaptation."	416
Strategy		
Strategy development	connection to strategy development given by the configurational approach --> managerial human-resources	
Climate change strategy	-	
Relevance for decision-making	connection to decision-making given by the configurational approach --> managerial human-resources	413f.
Business relevance	environments do matter for organizations	401
Miscellaneous		
Results	Authors give a resource oriented view on volatility --> see thesaurus	410f.

	dynamics and interactions among configurations are not addressed, nor their casualties and interrelationships	418
Criticism / Limits	possible that suggested configurations are reciprocally independent	418
	level of analysis which is functional and population level	418
Other important facts	Understanding of relationship between organization and environment has been considerable researched, especially by organizational theorists (contingency theory)	401f.
Further research investigations	identify intra-industry strategic groups (on basis of level of volatility) and study their competitive positioning over time	419
	empirical application of this construct to get information if relative importance of these configurations vary with a firm's stage of development, ist evolving strategy and the life cycle of ist products	419

		15
Name	Dunn	
First Name	Seth	
Title	Down to Business on Climate Change	
Year	2002	
Co-Authors	-	
Type of Article	Report	
Published by	Greenleaf Publishing	
Initiated by	Research Institute	
Ref.-ID	4624	
Ref.-type	Journal article	
Journal	Greener Management International	
Volume	39	
Issue	-	
pages	27-41	
Level of examination	Organization	
Country of origin	USA	
Subject	Management; Strategy	
Industry sector	Cross-sector	
Country	-	
Continent	-	
Ranking		
ISI-Factor	3.945	
VHB JQ2	-	
Handelsblatt	-	
Source	BSC	
Search term	corporate AND response AND climate change AND strategy	
Abstract	The technological, economic and policy dimensions of climate change are essential to understanding and formulating corporate strategic responses. Over the past decade, advances in greenhouse gas mitigation technologies, the refinement of economic models and their underlying assumptions, and the emergence of emissions trading and other market-based policy instruments have improved understanding of the potential of innovative technologies and policies to limit the costs of reducing emissions. These developments, accompanied by growing scientific evidence of climate risks and vulnerabilities and building political momentum toward binding emissions requirements, have prompted an increase in and diversification of corporate responses. This paper provides an overview of emerging business strategies to address climate change, focusing on engagement with international negotiations and the design and implementation of Kyoto mechanisms. Responses are differentiated by sector and region, revealing evidence of divergence, prospects for convergence and the importance of leadership.	
Code	Segment	Page
Aim of article	This paper provides an overview of emerging business strategies to address climate change, focusing on engagement with international negotiations and the design and implementation of Kyoto mechanisms	27
Adaptive capacity		
Definition	-	
Thesaurus	-	
Characteristics	-	
Adaptation	-	
Strategy		
Strategy development	-	
Climate change strategy	-	

Relevance for decision-making	-	
Business relevance	For some companies, the economic risks had long become apparent. Insurance and reinsurance companies are confronted with enormous liabilities from rising weatherrelated claims. German reinsurer Munich Re estimates that climate change could cost \$300 billion annually by 2050, through weather damage and impacts on industry and agriculture (see Cortese 2002)	31
Miscellaneous		
Results	Fortunately, the potential of new technologies and policies to slow climate change has grown dramatically over the past decade.	29
Criticism / Limits	-	
	This episode illustrates a trend toward constructive corporate engagement with climate negotiations—a trend driven by technological, economic and regulatory considerations. Early business responses to climate change were hindered by the prevalence of pessimistic economic models—which business associations touted—and by limited understanding and evidence of the potential of new technologies and policies to lower the cost of mitigation	28
Other important facts	Meanwhile, progress in the Kyoto Protocol negotiations has increased the probability of government regulations, leading more firms to place climate strategy within the realm of risk management.	28
	Not surprisingly, sectors with distinct technological and economic challenges have exhibited varying responses.	28
	For some companies, the economic risks had long become apparent. Insurance and reinsurance companies are confronted with enormous liabilities from rising weatherrelated claims. German reinsurer Munich Re estimates that climate change could cost \$300 billion annually by 2050, through weather damage and impacts on industry and agriculture (see Cortese 2002)	31

		16
Name	Gerwin	
First Name	Donald	
Title	Manufacturing Flexibility: A Strategic Perspective	
Year	1993	
Co-Authors	-	
Type of Article	Research Paper	
Published by	INFORMS: Institute for Operations Research	
Initiated by	University	
Ref.-ID	4708	
Ref.-type	Journal article	
Journal	Management Science	
Volume	39	
Issue	4	
pages	395-410	
Level of examination	Industry	
Country of origin	Canada	
Subject	Management; Operations Research	
Industry sector	Manufacturing	
Country	-	
Continent	-	
Ranking		
ISI-Factor	2.227	
VHB JQ2	A+	
Handelsblatt	1	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND business	
Abstract	To help meet competitive realities operations managers need to know more about the strategic aspects of manufacturing flexibility. This paper takes steps toward meeting that need by critically reviewing the literature and establishing a research agenda for the area. A conceptual model, which places flexibility within a broad context, helps to identify certain assumptions of theoretical studies which need to be challenged. The model also provides a basis for identifying specific flexibility dimensions. The manner in which these dimensions may limit the effectiveness of a manufacturing process, and the problems in operationalizing them are discussed. Focusing next on the neglected area of applied work, concepts are presented for analyzing whether desired amounts of flexibility are being achieved and whether the potential for flexibility built into a manufacturing process is being tapped. Once more, a procedure is outlined for altering a plant's types and amounts of flexibility over time. The research agenda, which grows out of the appraisal of theoretical and applied work, indicates the value in studying generic flexibility strategies, the flexibility dimensions, methods of delivery, ways of evaluating and changing a process's flexibility, and above all measurement problems. The conclusions indicate principles for strategic research, some of which have relevance for the development of mathematical models	
Code	Segment	Page
Aim of article	Decision makers therefore have a growing need for research on the strategic aspects of manufacturing flexibility. This paper helps to meet the need by critically reviewing the existing literature and developing a research agenda.	395
Adaptive capacity		
Definition	-	
Thesaurus	Flexibility is normally considered solely as an adaptive response to environmental uncertainty (Gupta and Goyal 1989).	396
	flexibility as an adaptive response.	397
Characteristics	-	
Adaptation	Adaptation represents the path in Figure 1 from uncertainty to strategy to flexibility and beyond.	396

Strategy		
	They found a significant positive relationship between uncertainty and strategy, and between strategy and performance	397
Strategy development	The performance measurement system insures that strategic and operational decisions are integrated. At the strategic level it is easy to concentrate on flexibility's role in handling uncertainties	396
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	Management must learn to cope with uncertainty whether it is based in product markets, or manufacturing processes and their inputs.	396
Miscellaneous		
Results	-	
Criticism / Limits	-	
Other important facts	In this sense flexibility is an investment which creates options for a company.	397
Further research investigations	Research is needed to uncover the reasons for gaps between required, potential and actual flexibility	408
	Detailed practical procedures for implementing changes in flexibility niust be developed from existing guidelines	408

		17
Name	Glor	
First Name	Eleanor D.	
Title	Assessing organizational capacity to adapt	
Year	2007	
Co-Authors	-	
Type of Article	Theoretical Paper	
Published by	Institute for the Study of Coherence & Emergence	
Initiated by	Non-academic	
Ref.-ID	4684	
Ref.-type	Journal article	
Journal	Emergence: Complexity & Organization	
Volume	9	
Issue	3	
pages	33-46	
Level of examination	Organization	
Country of origin	Canada	
Subject	Innovation	
Industry sector	-	
Country	-	
Continent	-	
Ranking		
ISI-Factor	-	
VHB JQ2	-	
Handelsblatt	-	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND business	
Abstract	Currently 65-70 percent of organizational change efforts fail. This paper suggests that the dominant, linear approaches to organizational change may be less functional than complexity analyses and approaches to organizational change. Focusing on self-organizing rather than linear relationships, the author attempts to distinguish organizational capacity for adaptability among different organizational patterns identified by Glor (2001a, 2001b), emphasizing the three complex factors of individuals, social dynamics, and the challenge of implementation. It defines adaptation using criteria drawn from the theory of complex adaptive systems: variety, reactivity, and capacity for self-organized emergence. At a conceptual level, the analysis is able to identify varying capacities for adaptation among the different organizational patterns, some of them surprising	
Code	Segment	Page
Aim of article	It defines adaptation using criteria drawn from the theory of complex adaptive systems: variety, reactivity, and capacity for self-organized emergence	33
Adaptive capacity		
Definition	-	
	Only those species (population categories) with sufficient disposable resources (adaptability to change) can survive at the higher fitness thresholds that occur during cascades of change. In this view, only those capable of self-organizing emerge as "the select."	34
Thesaurus	The inflection point is not always welcome in organizations. This phenomenon has been observed, for example, in epidemics, stock market crashes, and mobs. Many senior executives prefer not to have organizational change	34
	that has a life of its own; they prefer to decide it should happen	35
	Burke (2002) argued that the way to change organizations fundamentally is to intervene at the strategic level of the organization, in what he called transformational factors	35

	By drawing on the concepts of emergent patterns and adaptation in the CAS literature, it suggests that an executive or front-line employee who wants to create real change and adaptability within his or her organization must address the patterns of functioning of the organization. Unlike much of the management literature, this approach recognizes that these are not easy to change	35
	Glor (2001: a, b) for innovation are used here more broadly to apply to change generally, and criteria for adaptation drawn from the theory of complex adaptive systems are used to explore the capacity of organizations to be adaptive	35
	produced eight organizational innovation	36
	patterns: reactive, imposed, active, necessary, proactive, buy-in, transformational, and continuous innovation	37
	Using CAS as the conceptual structure for the change process, Glor's (2001a, b) eight organizational innovation patterns were treated as organizational change patterns and examined for their adaptive capacity.	37
Characteristics	is necessary to identify criteria for organizational systems that are adaptive and those that are not. According to Waldrop (1992: 314), complex natural systems that change quickly require variety and reactivity and are more likely to develop a capacity for self-organized emergence	38
Adaptation	-	
Strategy		
Strategy development	-	
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	-	
Miscellaneous		
	This is not a problem in and of itself, but is, rather, an indication that the outcomes Glor explored related to adaptation, and reinforces the idea that the concept of outcomes as used by Glor and the concept of adaptability in CAS are related. The concept of an outcome tends to be treated in administration and management as linear (though it is not, really), while the concept of adaptation is a biological and hence complex one	39
Results	Most organizational change strategies are premised on the assumption that the organizational pattern is reactive or buy-in. Although this may be understood intuitively, it is usually not understood explicitly. Hence, this is an area where organizations could benefit from implicit knowledge becoming explicit (Nonaka & Takeuchi, 1995).	43
	An organization that does not have a good capacity to change even when change is needed typically introduces change in a linear, power-based, no choices allowed, mechanistic manner	44
	As suggested by the analysis, change can occur in such an environment, but the organization relies overly on the knowledge and judgment of its executives.	44
Criticism / Limits	-	
	While theory about complex adaptive systems was developed largely in the domains of the hard sciences, mathematics and computers, it also incorporated the work begun during the 1940s by biologist Ludwig von Bertalanffy on general system theory (von Bertalanffy, 1968), whose work had more general applicability	33
Other important facts	A substantial literature now asserts that change and innovation emerge in complex human society and in organizations, sometimes when they are needed (Goldstein, 1994; Dooley, 1997; Lewin, 1999; Van Tonder, 2004a, b, c)	34
	The preferred strategy adopted by executives for creating change is structural change through reorganizations	35
	Since there is little organizational change theory (Burke, 2002: 121), this area is open to development.	36
Further research investigations	Many issues should be further researched and discussed. The analyses conducted in this paper need to be mathematically modeled and empirically tested.	44

		18
Name	Gulati	
First Name	Ranjay	
Title	Adaptation in vertical relationships: beyond incentive conflict	
Year	2005	
Co-Authors	Lawrence, Paul R.; Puranam, Phanish	
Type of Article	Theoretical Paper	
Published by	John Wiley & Sons, Inc.	
Initiated by	University	
Ref.-ID	4644	
Ref.-type	Journal article	
Journal	Strategic Management Journal	
Volume	26	
Issue	5	
pages	415-440	
Level of examination	Organization	
Country of origin	USA	
Subject	Management, Business	
Industry sector	Manufacturing	
Country	USA	
Continent	North America	
Ranking		
ISI-Factor	4.464	
VHB JQ2	A	
Handelsblatt	0.7	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND business	
Abstract	<p>In this study, we extend the analysis of adaptation in theories of economic organization beyond traditional considerations of incentive conflict (hold-up). We conceptualize adaptation as coordinated and cooperative response to change, and define the adaptive capacity of a vertical relationship as the ability to generate coordinated and cooperative responses across procurer and supplier to changes in procurement conditions. We draw on the concepts of differentiation and integration to dimensionalize the adaptive capacity of different modes of procurement. Using data on all component classes procured internally and externally by Ford and Chrysler, we show that different procurement modes differ in terms of their adaptive capacity and performance. We also show that performance differences across modes of procurement arise as a function of the match between adaptive capacity and adaptation requirements associated with the exchange, and not only the match between governance form and transaction hazards.</p>	
Code	Segment	Page
Aim of article	We conceptualize adaptation as coordinated and cooperative response to change, and define the adaptive capacity of a vertical relationship as the ability to generate coordinated and cooperative responses across procurer and supplier to changes in procurement conditions.	415
	However, we will argue in this paper that adaptation failures in vertical relationships can also occur for reasons other than hold-up (or concerns about hold-up).	416
Adaptive capacity		
Definition	Along the lines of Williamson (1991a, 1991b) we define the adaptive capacity of a vertical relationship (within or across firm boundaries) as the ability to generate coordinated and cooperative responses across procuring and supplying units to changes in exchange conditions.	416
	We assess the adaptive capacity of different modes of organizing procurement using the concepts of differentiation and integration	416
	As a result, they vary in terms of their adaptive capacity: their capacity to respond in a coordinated and cooperative manner to changes in exchange conditions.	417

	Vertical (procurement) relationships have always been the favorite empirical domain of theorists of economic organization (Coase, 1937; Grossman and Hart, 1986; Williamson, 1975). Such relationships involve exchange between adjacent stages of the value chain, and they occur both within firms (e.g., between different functional or divisional areas within a firm) and between firms (e.g., between specialist design firms and specialist manufacturers)	415
Thesaurus	Williamson also notes that in addition to incentive conflict, failures of adaptation may arise 'because autonomous parties read and react to signals differently, even though their purpose is to achieve a timely and compatible combined response' (Williamson, 1991a)	415
	In prior literature on organizations, these concepts have been used to formulate principles for designing subunits within organizations that could adapt to change (Daft, 2001; Lawrence and Lorsch, 1967a, 1967b; Nohria and Ghoshal, 1994)	416
	vertical alliances (or 'ally'), a hybrid form that indicates a relationship characterized by continuity between two independent firms operating at successive stages in a vertical chain of production, with both firms expecting the interaction to continue into the future	417
	Integration not only requires the alignment of interests (cooperation), but also the alignment of actions (coordination).	419
	Differentiation refers to the differences across organizational subunits that arise as a consequence of their local adaptation to unit-specific tasks and environments (Dougherty, 2001).	417
	Differentiation at the subunit level increases the responsiveness of the aggregate organization (and hence its adaptiveness), as it creates organizational diversity. Differentiated and diverse organizational subunits can recognize and engage in a wider search for new opportunities when environmental conditions change (Cohen and Levinthal, 1990; Ethiraj and Levinthal, 2004; Lawrence and Lorsch, 1967b; Rivkin and Siggelkow, 2003).	417
	Achieving integration between interdependent organizational subunits is necessary in order to respond effectively to change (Nadler and Tushman, 1998; Thompson, 1967; Van de Ven and Walker, 1984).	417
Characteristics	Differentiation is the 'state of segmentation of the organizational system into subsystems, each of which tends to develop particular attributes in relation to the requirements posed by its relevant external environment' (Lawrence and Lorsch, 1967b: 4). It refers to the degree to which organizational units have developed distinctive structural characteristics and their members have made behavioral accommodations to their environment. It thus captures organizational differences across the procuring and supplying organizational subunits as a consequence of specialization and local adaptation, and it results in organizational diversity.	418
	Integration is the 'quality of the state of collaboration that exists among departments that are required to achieve unity of effort by the demands of the environment	418
	While traditionally applied to departments within a firm, the notion of integration can also be used to understand relationships between organizational units from different firms.	418f.
	who saw the essence of organizational adaptation as the generation of integrated responses to changed circumstances.	416
Adaptation	Barnard rapidly accumulated on the design attributes of complex organizations comprising multiple, interdependent subunits that enabled them to achieve coordinated adjustments to changes in their environment (Daft, 2001; Galbraith, 1977; Nadler and Tushman, 1998). We develop and extend this tradition of research on organizational adaptation initiated by Barnard to the inter-organizational context	417
	The adaptation perspective we develop revives an extensive tradition of research on adaptation within organizations (Galbraith, 1977; Nadler and Tushman, 1997; Nohria and Ghoshal, 1994; Daft, 2001; Donaldson, 2001), which has focused on the issues of coordination and responsiveness that have been central to our discussion of adaptive capacity.	433
Strategy		
Strategy development	-	
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	-	
Miscellaneous		
Results	Our empirical analysis shows that the observed levels of differentiation and integration vary systematically with the type of procurement mode.	433

	We have also argued that these differences in adaptive capacity across procurement modes result in performance differences across modes of exchange	433
	We have intentionally focused on sources of adaptation pressures other than volume uncertainty and asset specificity. For instance, transaction instability combines the concepts of volume and technological uncertainty (Walker and Weber, 1984, 1987).	434
	Adaptation is not only cooperative adjustment; it is also coordinated adjustment.	435
	However, when high levels of instability combine with high levels of interdependence, then vertical relationships may be optimally organized through alliances	436
Criticism / Limits	-	
Other important facts	In addition to conformity pressures, the career advancement systems in hierarchies, which favor generalists over specialists, can limit the degree of differentiation possible. In contrast, supplying units outside the firm are unlikely to face pressures toward conformity with each other, though they may face pressures to conform to other units within their own firms.	418
	In contrast, coordination problems arise due to the lack of shared and accurate knowledge about the decision rules that others are likely to use and how one's own actions are interdependent with those of others (Geanakoplos, 1992; Malmgren, 1961; Milgrom and Roberts, 1992; Thompson, 1967).	419
Further research investigations	-	

Name	Hart
First Name	Stuart L.
Title	Beyond Greening: Strategies for a sustainable world
Year	1997
Co-Authors	-
Type of Article	Research Paper
Published by	Harvard Business School Publication Corp
Initiated by	University
Ref.-ID	4687
Ref.-type	Journal article
Journal	Harvard Business Review
Volume	75
Issue	1
pages	66-76
Level of examination	Organization
Country of origin	USA
Subject	Business; Management; Environmental
Industry sector	Cross-sector
Country	-
Continent	-
Ranking	
ISI-Factor	1.655
VHB JQ2	D
Handelsblatt	0.4
Source	Journal
Search term	Searched within Journal
Abstract	<p>Three decades into the environmental revolution, many companies in the industrialized nations have recognized that they can reduce pollution and increase profits at the same time. But beyond corporate "greening" lies the enormous challenge--and opportunity--to develop a sustainable global economy, one that the planet is capable of supporting indefinitely. Stuart Hart, director of the Corporate Environmental Management Program at the University of Michigan School of Business, explains the imperative of sustainable development and provides a framework for identifying the business opportunities behind sustainability. The dangers today are clear: exploding population growth, rapid depletion of resources, and ever more industrialization and urbanization are creating a terrible environmental burden. Companies normally frame greening in terms of risk reduction, reengineering, or cost cutting. But, says Hart, when greening becomes part of strategy, opportunities of potentially staggering proportions open up. A number of companies are moving in that direction. BASF, for example, is collocating plants to make the recycling of waste feasible, and Xerox is reusing parts from leased copiers on new machines. Hart identifies three stages of environmental strategy: pollution prevention, product stewardship, and the development of clean technology. But companies will not benefit from such efforts unless they draw a road map that can show them how new products and services must evolve and what competencies they will need. Businesses that create a vision of sustainability will be ready to take advantage of the opportunities presented by the need for a sust. global economy.</p>

Codings sheet due to technical reasons not integrated.

		20
Name	Hertin	
First Name	Julia	
Title	Climate change and the UK house building sector: perceptions, impacts and adaptive capacity	
Year	2003	
Co-Authors	Berkhout, Frans; Gann, David; Barlow, James	
Type of Article	Research Paper	
Published by	Routledge	
Initiated by	University, Innovation institute	
Ref.-ID	4649	
Ref.-type	Journal article	
Journal	Building Research & Information	
Volume	31	
Issue	3	
pages	278	
Level of examination	Organization	
Country of origin	UK	
Subject	Construction & Building Technology	
Industry sector	Construction	
Country	UK	
Continent	Europe	
Ranking		
ISI-Factor	1.259	
VHB JQ2	-	
Handelsblatt	-	
Source	BSC	
Search term	"adaptive capacity" AND climat* change AND strategy AND compan*	
Abstract	<p>This paper explores how climate change could affect the UK house-building sector, focusing on the question of how companies can adapt to changing climatic conditions. It presents the results of in-depth interviews in five house-building companies in the UK. We start from the assumption that climate change is only one driver among many, including technological innovation, shifting consumer expectations and changing regulation that the industry faces. This approach draws on insights that are well established in the management and innovation literatures, but have often been neglected in studies of climate change. We report research about the perceptions of house builders about future impacts of climate change, potential adaptation measures that may be open to them and their ability to carry out these measures. The paper draws conclusions about the challenges that climate change presents to the UK house building industry</p>	
Code	Segment	Page
	This paper presents the results from the first phase of a project aimed at providing a better understanding of the economic and institutional consequences that climate change could have for the house-building sector	279
Aim of article	While the present paper does not propose a new theory of adaptation, it aims to provide an empirical justification for a more institutionalist approach to the analysis of adaptation. It also provides insights into the notions of 'adaptation' and of 'adaptive capacity' in organisations	281
	Rather than perceiving the response to climate change as a largely technological challenge, our research has focused on the behaviour of the different actors involved in adaptation: their perceptions and incentives; the constraints they work under; and the relationships between them	281
Adaptive capacity		
	It is widely recognised that adaptive behaviour to a large extent will determine the nature and scale of impacts, and that it therefore needs to be central to the study of climate change	279
Definition	Adaptive capacities: The ability of a system to adjust to climate change (including climate variability and extremes), to moderate potential damages, to take advantage of opportunities, or to cope with the consequences	280

Thesaurus	They argue that adaptation needs to be seen as a continuous process in response to external forces and involves processes of signal detection, evaluation, decision and response, and feedback.	280
	In short, this literature argues that in adapting to new pressures, organisations face a number of informational, institutional, cultural and financial constraints on their ability to learn (Levinthal and March, 1993)	280
Characteristics	Moreover, incentives to change and the capacity to change will be determined by many factors including leadership, management capabilities, organisational culture, strategy and implementation (Garvin, 1993; Leonard-Barton, 1995)	280f.
	An intervening factor – termed ‘adaptive capacity’ here – will determine the extent to which companies become aware of their vulnerability, and can evaluate, make decisions about and implement adaptation measures, whether in anticipation of or in response to climate change impacts	286
	Adaptive capacity in the context of climate change is related to an awareness of the need to adapt, the ability to make decisions	286
	about which measures to take and the capacity to implement and control the adaptation process.	287
	Instead, it seems based on a combination of both internal capabilities of firms and their external relationships	287
	flexible risk management process	287
	Strong in-house technical expertise facilitates the process of evaluating, choosing and implementing technological adaptation options	287
	Effective internal communication	287
	Good external relationships	287
	Good relationships with actors	287
Adaptation	Transparent and consistent regulatory process	287
	Despite its growing importance in the policy debate about climate change, academic research into adaptation is still at an early stage, both theoretically and empirically (Smit et al., 2000)	279
	Research has tended overwhelmingly to focus on just three sectors: agriculture (e.g. Adams et al., 1993; Smit et al., 1996), water resources (Stakhiv, 1996; Arnell, 1999) and coastal defence (Yohe et al., 1996)	279
	Those studies that do take adaptation into account often assume that adaptive behaviour is a question of optimal choices between a broad set of clear alternatives made by individuals and firms pursuing their personal interests (Mendelsohn et al., 1994; Mendelsohn, 2000). This position holds that adaptation can be regarded as ‘efficient’ if ‘the cost of making the effort is less than the resulting benefits’ (Mendelsohn, 2000 p. 585)	280
Adaptation: Adjustments in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities	280	
Strategy		
Strategy development	that the portfolio of options adopted by any given firm will depend on their climate sensitivity, their internal resources and capabilities, their market and regulatory context, and the adaptation strategy they adopt (‘wait and see’, risk bearing, etc.).	281
	The large majority of interviewees suggested that climate change adaptations would not be principally different from many other strategic choices that companies currently face, and that choices to adapt to climate changes are likely to be entangled with choices to adapt to other external pressures	286
Climate change strategy	An adaptation strategy expresses the present and the desired future position of a company in relation to climate change impacts. It also helps to communicate a company’s attitude towards climate change internally and externally. To support this process, the tool lists key issues in relation to climate change strategy and provides an example of a policy statement.	?
Relevance for decision-making	It is important to recognise that from the point of view of companies, climate change is (and will remain) only one factor that influences strategic decision-making among many others	288
Business relevance	Climate models predict there will be changes in mean temperature and rainfall, changes in the variability of climatic conditions and changes in the occurrence of extreme weather conditions (i.e. a rise in the incidence and intensity of storms) (Pittock and Jones, 2000).	279
	We believe there is a need for a theory of adaptive behaviour that goes beyond the assumption of ex post optimisation of benefits and costs by private actors. Such an explanation would draw on innovation and management literatures that stress the role of uncertainty, perceptions and choice	280
	n discussing these impacts, we make a distinction between direct and indirect impacts. Direct impacts are physical impacts associated with changing climatic conditions (temperature, precipitation, storminess, etc.)	281

	Generally speaking, climate change was seen as an issue on the horizon rather than something that required action at present	282
Miscellaneous		
	Although information about climate change had not been assessed in any systematic way in these companies	282
	For example, while a strategic land manager in the south of England was most worried about increased flooding, a technical director of a company operating in London was more concerned about changing demands for heating and cooling in buildings	282
	In general, we found that the perceived exposure of house builders to direct effects of climate change was relatively limited.	282
	Indirect impacts could be more important than direct weather effects, especially for speculative house builders. Most interviewees held the view that house builders would be affected by two main drivers: regulation and customer demand	284
	A review of potential adaptation measures suggested that three different modes of adaptation could be distinguished: changes to the overall commercial strategy of the firm (commercial adaptation); changes to technologies used to produce or deliver products or services (technological adaptation); and changes related to the financial management systems, funding or insurance of the company (financial adaptation)	284
	Direct climatic effects on the construction process, including a larger number of days when certain tasks cannot be carried out, and damage to materials, could be a significant challenge to house builders	288
Results		
	Because managing the construction process is one of the core activities of house builders, they would tend to see it as their responsibility to ensure that construction is not adversely affected by weather conditions	288
	Climate-related adaptations will be made against the background of a number of other, perhaps more important, drivers of change: changing technologies, shifting consumer expectations, emergence of new competitors, changing regulations, and so on	288
	Adaptation processes are likely to correspond to a model of satisficing rather than optimising behaviour by organisations	288
	Organisational adaptations will always include elements of uncertainty, choice and strategy. Whether a company chooses to be proactive or reactive; to take risks or to avoid them; to think long- or short-term, is not primarily a question of whether adaptation options exist whose outcomes are unambiguously predictable ex ante.	288
	Most adaptations require chains of adjustment and innovation, and complex management processes in areas such as design, project planning, choice of suppliers and logistics	288
	In other cases (development on riverine flood plains) the obverse is true, and adaptations that could bring benefits to the company, in terms of reduced climate sensitivity or greater adaptive capacity, run counter to prevailing trends	288
Criticism / Limits	-	
Other important facts	Most adaptation is seen as being reactive and ex post because actors will find it difficult to predict climate changes at their locality	280
Further research investigations	The next stage of the research aims to translate these empirical findings into a conceptual model of adaptation of organisations that gives a better representation of organisational adaptation and the key variables influencing it	289

Name	Hoffman
First Name	A.
Title	The coming market shift: Business Strategy and Climate Change
Year	2007
Title (Book)	Cut Carbon, Grow Profits: Business Strategies for Managing Climate Change and Sustainability
Co-Authors	Tang, K.; Yeoh, R.
Type of Article	Book chapter
Published by	Middlesex University Press
Initiated by	Tang, K.; Yeoh, R.
Ref.-ID	4658
Ref.-type	Book chapter
Journal	
Volume	-
Issue	-
pages	101-117
Level of examination	Organization
Country of origin	USA
Subject	Business, Strategy, Environmental
Industry sector	Cross-sector
Country	Cross-country
Continent	-
Ranking	
ISI-Factor	-
VHB JQ2	-
Handelsblatt	-
Source	Google Scholar
Search term	Searched within reference list
Abstract	-

Codings sheet due to technical reasons not integrated

		22
Name	Jarzabowski	
First Name	Paula	
Title	Strategy as practice: recursiveness, adaptation, and practices-in-use	
Year	2004	
Co-Authors	-	
Type of Article	Theoretical Paper	
Published by	Sage Publications, Ltd.	
Initiated by	University	
Ref.-ID	4672	
Ref.-type	Journal article	
Journal	Organization Studies	
Volume	25	
Issue	4	
pages	529-560	
Level of examination	Organization	
Country of origin	UK	
Subject	Management, Strategy	
Industry sector	-	
Country	-	
Continent	-	
Ranking		
ISI-Factor	2.124	
VHB JQ2	B	
Handelsblatt	0.7	
Source	Google Scholar	
Search term	Searched within reference list	
Abstract	In this article, a social theory framework is developed to explain the common themes of recursive and adaptive practice underpinning the existing strategic management literature. In practice, there is a coexistent tension between recursive and adaptive forms of strategic action that spans multiple levels from macro-institutional and competitive contexts to within-firm levels of analysis to individual cognition. This tension may be better understood by examining how management practices are used to put strategy into practice. Such practices span multiple levels of context and are adaptable to their circumstances of use, serving to highlight both general characteristics and localized idiosyncrasies of strategy as practice. The article develops the concept of management practices-in-use into a research agenda and nine broad research questions that may be used to investigate empirically strategy as practice.	
Code	Segment	Page
	In this article, a social theory framework is developed to explain the common themes of recursive and adaptive practice underpinning the existing strategic management literature	529
Aim of article	In this article, we develop a social theory framework for strategy as practice that makes links to these and other strategic management literatures, and provides a platform for the empirical investigation of strategy as practice.	529
	Our intention is to develop a more holistic understanding of the nature of strategy as practice through the integration of diverse theoretical perspectives (Spender 1998).	530
Adaptive capacity	It appears that important structural, cultural, and processual characteristics for adaptive capacity are sufficient diversity of firm capabilities combined with sufficient slack to permit social integration and the development and exploitation of these capabilities.	540
	By contrast, research on new forms of organizing suggests that organizational structuring can help to realize innovative and adaptive capacity (Pettigrew and Fenton 2000; Whittington et al. 1999).	540

	Recently, studies have attempted to grasp the adaptive capacity of the firm in relation to dynamic markets. In this literature, the firm is a complex adaptive system (Pascale 1999) that is able to restructure rapidly through patching on new divisions, discarding obsolete ones, and merging or splitting structural configurations in accordance with market changes (Eisenhardt and Brown 1999).	541												
Definition	-													
	<p>Table 2. Adaptive Practice in Social Theory and the Strategic Management Literature</p> <table border="1"> <thead> <tr> <th>Social theories</th> <th>Contributions to strategy as practice</th> <th>Examples in the strategy literature</th> </tr> </thead> <tbody> <tr> <td>Social becoming (Sztompka 1991)</td> <td>Social movement occurs through interaction between macro- and micro-contexts. There are many macro-contexts, thus social institutions are divergent.</td> <td>Strategy process Strategic choice Knowledge-based view</td> </tr> <tr> <td>Modernity, pluralism (Giddens 1991)</td> <td>Micro-contexts are prone to adaptation and learning through internal tensions generated from problems or the displacement and renewal of members.</td> <td>Dynamic capabilities Organizational learning New forms of organizing</td> </tr> <tr> <td>Communities of practice (Brown and Duguid 1991, 2001; Lave and Wenger 1991; Wenger 1998)</td> <td>Therefore, strategy as practice is adaptive, flexible, and prone to learning and becoming</td> <td>Time-pacing in dynamic markets Patching</td> </tr> </tbody> </table>	Social theories	Contributions to strategy as practice	Examples in the strategy literature	Social becoming (Sztompka 1991)	Social movement occurs through interaction between macro- and micro-contexts. There are many macro-contexts, thus social institutions are divergent.	Strategy process Strategic choice Knowledge-based view	Modernity, pluralism (Giddens 1991)	Micro-contexts are prone to adaptation and learning through internal tensions generated from problems or the displacement and renewal of members.	Dynamic capabilities Organizational learning New forms of organizing	Communities of practice (Brown and Duguid 1991, 2001; Lave and Wenger 1991; Wenger 1998)	Therefore, strategy as practice is adaptive, flexible, and prone to learning and becoming	Time-pacing in dynamic markets Patching	534
Social theories	Contributions to strategy as practice	Examples in the strategy literature												
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	Adaptation (meaning varying degrees of change from incremental adjustment to radical reorientation) may be explained using the theory of social becoming	535												
	That is, just as the literature on knowing in practice suggests that knowledge is not something that a firm has, but knowing in action, something that a firm and its actors do (Cook and Brown 1999), so we should examine strategy not as something a firm has, but something a firm does.	529												
	recursiveness and adaptation. These two core elements of practice implicitly underpin much of the current strategic management literature and constitute one of the key tensions for strategy practitioners (cf. Garud and Karnoe 2001)	530												
	The routinized nature of practice may be explained by theories of social order, such as structuration (Giddens 1984), in which the interaction between agents and socially produced structures occurs through recursively situated practices that form part of daily routines. Structures are the collective systems within which human actors carry out their daily activities. Structures constrain and enable human action and are also created and recreated by actors who draw upon social structure in order to act.	531												
	Bourdieu (1990) further elaborates reciprocity as the dialectic of social structures and structuring dispositions within which every practical action occurs. This dialectic is the 'habitus', which is socially constructed but transcends the individual, being 'constituted in practice and ... always oriented towards practical functions' (Bourdieu 1990: 52). Practice comprises social order residing both in people's minds and in the habitus, which functions as a form of collective memory.	532												
	Both Bourdieu and Giddens provide a rationale for the stable and institutional characteristics of practice, albeit that structuration predicates this stability on the ontological security of the actor, while habitus is more structurally oriented. This focus on stability obscures the adaptive nature of practice (cf. Orlikowski 2000) and will be termed here the 'problem of recursiveness'.	532												
	The mental models of actors are subject to structural influences such as formal operating procedures (Cyert and March 1963),	532												
	Routines are socially complex, embedded, and interlocked. They comprise a social architecture that penetrates a firm's communication channels, information filters, and problem-solving strategies, making it difficult for the firm to absorb new technologies (Henderson and Clark 1990).	533												
	These characteristics may be considered firm resources, building distinctive traits that are a non-transferable source of competitive advantage.	533												
	However, path dependence means that resources are difficult to shed or reconfigure quickly. Strategically, a firm is liable to exploit and build upon existing resources (Grant 1991), exhibiting resource deepening behaviour that channels evolution along familiar lines (Karim and Mitchell 2000), even where these are no longer viable	533												
	The distinctive social structures of a firm may thus be seen as its core rigidities (Leonard-Barton 1992), predisposing recurrent action patterns (Cohen et al. 1996) and leading to organizational inertia (Hannan and Freeman 1984; Rumelt 1995). These concepts of organizational stability are implicitly underpinned by the social theory of habitus, that is, that social structure assimilates information that is self-reinforcing and resistant to change.	533												
	However, for each of the arguments above, there are counter-arguments that suggest practice also has adaptive characteristics (see Table 2). In order to understand practice as an ongoing social process, capable of encompassing both stability and change, we now turn to social theories of coexistent and dynamic interaction between agent and structure.	534												
	.In strategy process studies, change arises from the interaction between embedded levels of context, from the socio-economic to the industry to the firm (Pettigrew 1987; Pettigrew and Whipp 1991)	535												
Thesaurus	RBV proposes that firms are heterogeneous, with competitive advantage arising from their unique and idiosyncratic bundling of firm resources (Barney 1991). In addition to physical resources, RBV includes intangible assets such as social complexity as a source of advantage. However, RBV has been criticized for its market-based assumptions that commodify socially embedded processes (Cook and Brown 1999; Scarborough 1998) and ignore the dynamism inherent in strategic action (Spender 1996).	537												

	Resources may provide competitive advantage at a moment in time, but their adaptation and, thus, the sustainability of competitive advantage in changing environments is less apparent, suggesting the rigidities and routines of the previous section (cf. Cockburn et al. 2000).	537
	A more adaptive form of localized heterogeneity may be found in theories of competitive advantage based upon knowledge resources (Grant 1996; Spender 1996) and dynamic capabilities (Helfat 2000; Teece et al. 1997).	537
	Dynamic capabilities are ‘processes that use resources — specifically the processes to integrate, reconfigure, gain and release resources — to match and even create market change’ (Teece et al. 1997). New resource configurations, that is, adaptive practice, may be generated from the use of existing resources. Importantly, dynamic capabilities are perceived to generate change inside the firm and also to lead to market change, suggesting interaction between micro- and macro-contexts	538
Characteristics	-	
Adaptation	On one hand, the world is always changing — more or less — and so organisations must adapt. On the other hand, most organisations need a basic stability in order to function efficiently’ (Mintzberg 1994: 184)	530
Strategy		
	‘The strategists’ fundamental dilemma [is] having to reconcile the concurrent but conflicting needs for change and stability	530
	In this section, a theoretical foundation for two key practice themes, recursiveness and adaptation, is built upon four main areas of social theory: structuration (Giddens 1984), habitus (Bourdieu 1990), social becoming (Sztompka 1991), and communities of practice (Brown and Duguid 1991,2001).	530
	Practice is the actual activity, events, or work of strategy, while practices are those traditions, norms, rules, and routines through which the work of strategy is constructed (Turner 1994; Whittington 2002)	545
Strategy development	On one hand, the world is always changing — more or less — and so organisations must adapt. On the other hand, most organisations need a basic stability in order to function efficiently’ (Mintzberg 1994: 184)	530
	Such firms grasp strategic opportunities through lowformalization of strategy processes and simple rules (Eisenhardt and Sull 2001) that hasten strategic responses, permitting the firm to meet and create market conditions (Brown and Eisenhardt 1997).	541
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	-	
Miscellaneous		
	In practice, there is a coexistent tension between recursive and adaptive forms of strategic action that spans multiple levels from macro-institutional and competitive contexts to within-firm levels of analysis to individual cognition. This tension may be better understood by examining how management practices are used to put strategy into practice.	529
Results	Culturally adaptive organizations are characterized by decentralization, with the role of senior management being to support and align strategic initiatives arising at other levels of the firm (Bartlett and Ghoshal 1993). When strategy participation is more widespread, with decentralized decision-making, cultures are more predisposed to creativity (Garud and Karnoe 2001; Shaw et al. 1998) and broader learning attitudes to risk-taking (Easterby-Smith 1990; Eisenhardt and Sull 2001). Firms are, therefore, more prone to adaptive practice when they are populated by diverse and heterogeneous communities. However, there are structural and processual considerations if these communities are to be integrated into the strategy process (Van Looy et al. 2001).	539
	A further examination of competitive environments highlights the different adaptive responses needed in conditions ranging from stable competition to hyper-competition. While recursive forms of practice may be appropriate under stable competition, hyper-competitive markets characterized by disruptive technologies and high product obsolescence require continuous adaptation in order to create new markets (D’Aveni 1994). Under such competitive conditions, flexible organizational structures (Volberda 1996) and greater interaction between managerial levels (Floyd and Lane 2000) enhance the capacity for strategic renewal.	542
Criticism / Limits	-	
Other important facts	While the diversity of social theory approaches might be criticized for eclecticism, practice is posited as the point of interaction between pluralist epistemologies (Cook and Brown 1999)	530
Further research investigations	What characteristics of the within-firm context, such as power, structure, culture, and diversity, might be associated with more adaptive or more recursive uses of particular management practices?	549

How are practices appropriated in order to meet the goals and needs of actors within a given firm and what are the consequences of such uses upon the recursive or adaptive behaviour of the firm?	549
Under what circumstances do actors find that existing practices are obsolete or need to be adapted for use?	550
In particular, we may develop a link between practice and firm behaviour by analysing tendencies toward recursive or adaptive use of practices and the impact that this has upon strategic action over time under different institutional and competitive conditions. Such analyses are both theoretically important and have practical implications for cross-firm and cross-sector learning about the nature and uses of strategy as practice	552

		23
Name	Jerez-Gomez	
First Name	Pilar	
Title	Organizational learning capability: a proposal of measurement	
Year	2005	
Co-Authors	Céspedes-Lorente, José; Valle-Cabrera, Ram	
Type of Article	Research Paper	
Published by	Elsevier Science Publishing Company, Inc.	
Initiated by	University	
Ref.-ID	4657	
Ref.-type	Journal article	
Journal	Journal of Business Research	
Volume	58	
Issue	6	
pages	715-725	
Level of examination	Industry	
Country of origin	Spain	
Subject	Business, Organization	
Industry sector	Manufacturing	
Country	Spain	
Continent	Europe	
Ranking		
ISI-Factor	1.293	
VHB JQ2	B	
Handelsblatt	0.4	
Source	BSC	
Search term	“adaptive capacity” AND climat* change AND strategy AND business	
Abstract	This paper develops a measurement scale for organizational learning capability, supported by the results of a validation study covering a sample of ill Spanish firms from the chemical industry. From a strategic viewpoint, the measurement scale identifies the elements that form learning capability, highlighting its complex and multidimensional nature. The evidence that the results provide regarding the scale's validity suggests that we may use this tool in future research work requiring a measurement of learning capability. Likewise, the scale provides information that could be of use to those managers wishing to improve learning capability in their firms.	
Code	Segment	Page
Aim of article	Our objective is to contribute towards the level of knowledge regarding organizational learning, developing a measurement tool that is adapted to its multidimensional nature	715
Adaptive capacity		
Definition	-	
Thesaurus	The analysis of organizational learning has become an increasingly important study area over recent years	715
	Although organizational learning has its roots in individual learning (Shrivastava, 1983; Senge, 1990), the process that leads to its development is not as simple as just adding together the individual learning of the organization's different members (Argyris and Schön, 1978; Hedberg, 1981)	716
	organizational learning as the capability of an organization to process knowledge—in other words, to create, acquire, transfer, and integrate knowledge, and to modify its behavior to reflect the new cognitive situation, with a view to improving its performance	716
	The effective development of organizational learning	716
	First, company management must provide decisive backing to organizational learning (Stata, 1989; Garvin, 1993). Management should spearhead the process, making clear its support and involving all the personnel	716
Second, it requires the existence of a collective conscience	716	

	Third, it needs the development of organizational knowledge, based on the transfer and integration of knowledge acquired individually	716
	Lastly, simply adapting to the changes within the established framework does not suffice for learning capability to be a source of heterogeneity among firms inasmuch as adaptation is an inadequate response in the current competitive environment	716
	These dimensions, called managerial commitment, systems perspective, openness and experimentation, and knowledge transfer and integration, sum up the aspects mentioned previously as the basic elements needed for an organization to learn, and constitute our organizational learning structure model	717
	Finally, management should drive the process of change, taking the responsibility for creating an organization that is able to regenerate itself and face up to new challenges (Lei et al., 1999).	717
	1992; Kofman and Senge, 1993; Nevis et al., 1995). Viewing the firm as a system implicitly involves recognizing the importance of relationships based on the exchange of information and services (Ulrich et al., 1993)	717
	Openness and experimentation Our unit of analysis is generative or double-loop learning, which requires a climate of openness that welcomes the arrival of new ideas and points of view, both internal and external, allowing individual knowledge to be constantly renewed, widened, and improved	717
	This fourth dimension refers to two closely linked processes, which occur simultaneously rather than successively: internal transfer and integration of knowledge. The efficacy of these two processes rests on the previous existence of absorptive capacity (Cohen and Levinthal, 1990), implying the lack of internal barriers that impede the transfer of best practices within the firm (Szulanski, 1996)	717
Characteristics	First, knowledge and, more specifically, its acquisition or creation, along with its dissemination and integration within the organization, become a key strategic resource (Grant, 1996; Zander and Kogut, 1995; Teece et al., 1997)	716
	Second, this creation and dissemination of new knowledge imply the existence of constant internal changes that can occur at a cognitive or behavioral	716
	Third, these internal changes lead to a process of constant improvement that allows the firm's actions to be maintained or bettered	716
Adaptation	-	
Strategy		
Strategy development	-	
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	-	
Miscellaneous		
Results	-	
Criticism / Limits	-	
Other important facts	-	
Further research investigations	-	

		24
Name	Jeswani	
First Name	Harish Kumar	
Title	How warm is the corporate response to climate change? evidence from pakistan and the UK	
Year	2008	
Co-Authors	Wehrmeyer, Walter; Mulugetta, Yacob	
Type of Article	Research Paper	
Published by	John Wiley&Sons, Inc.	
Initiated by	Research Centre	
Ref.-ID	4650	
Ref.-type	Journal article	
Journal	Business Strategy & the Environment	
Volume	17	
Issue	1	
pages	46-60	
Level of examination	Industry	
Country of origin	UK	
Subject	Managment, Environmental Science	
Industry sector	Cross-sector	
Country	Pakistan	
Continent	Asia	
Ranking		
ISI-Factor	-	
VHB JQ2	B	
Handelsblatt	0.3	
Source	BSC	
Search term	corporate AND response AND climate change AND strategy	
Abstract	<p>In response to growing consensus among scientists and governments to act fast to avoid dangerous impacts of climate change, many industries have started to prepare for a carbon-constrained world. However, this response is far from being uniform. Often action is predicated on economic, technological, organizational and institutional drivers and barriers, which vary between countries and across industrial sectors. In order to understand the effectiveness of industry response, it is therefore important to analyse corporate response across different sectors in different countries. Focusing on the nine most energy-intensive and greenhouse gas (GHG) emitting industrial sectors, this paper compares corporate responses to climate change in Pakistan and the UK. By analysing the divergence of strategies adopted by industries across different sectors in two countries, the paper examines the key factors influencing corporate adoption and implementation of GHG reduction and energy-efficiency strategies in Pakistan and the UK.</p>	
Code	Segment	Page
	Focusing on the nine most energy-intensive and greenhouse gas (GHG) emitting industrial sectors, this paper compares corporate responses to climate change in Pakistan and the UK.	46
	This paper investigates the corporate activities in response to climate change in different sectors in Pakistan (developing country) and the UK (industrialized country)	47
Aim of article	The resulting factors served as strategy dimensions for a cluster analysis, which was subsequently carried out on these factors. Cluster analysis is a statistical technique whose purpose is to group companies (objects) based on their factor scores on operational and managerial activities(characteristics) (Hair et al., 2006). This would work out the different organizational categories for the climate change strategy and allow unidirectional attribution of companies to specified clusters	51
Adaptive capacity		
Definition	-	
Thesaurus	-	
Characteristics	-	

Adaptation	-																																																		
Strategy																																																			
	has led to the development of more than 50 models and typologies to classify corporate strategies, behaviours and performances (Kolk and Mauser, 2002)	48																																																	
	Strategy types: “indifferent” : nothing, not even aware; “Beginner” : awareness, first step: GHG emission targets; “emerging” : These organizations are generally not the first movers but however try to follow the leaders. ‘Emerging’ organizations have adopted environmental management systems but have not necessarily certified them externally. These organizations are aware of their energy-efficiency options but actions are generally limited to meeting the legal requirements. With respect to GHG emissions, these organizations have taken actions such as preparing GHG inventory, benchmarking of their emissions, setting GHG targets and preparing policy response. “active” : Their environmental management system is fully developed and integrated with other business strategies. They carry out a wide range of operational activities including making changes in the product or input specifications to reduce their emissions, substituting a part of their fuel consumption with solar, wind, biomass or other renewable energy sources etc. These organizations typically have prepared GHG inventories, conducted energy assessments and identified improvement opportunities. These organizations also engage actively with external stakeholders such as regulatory bodies,	53f.																																																	
Strategy development	Stakeholders’ Influence In general, only three stakeholders (namely owners/corporate, company management and regulatory agencies) are viewed by the respondents as having ‘strong influence’ on their activities	54																																																	
	Drivers and Barriers ‘Cost savings’, ‘management commitment’, ‘corporate targets’ and ‘compliance with regulations’ are identified as the most important drivers by all four types of company; however, ‘active’ firms perceive these drivers as more important than the ‘indifferent’ industries	55																																																	
	High Cost and Lack of Financial Resources	55																																																	
	Limited access to capital leads to higher hurdles for energy-efficiency investments, because capital is used for competing investment priorities (Worrell et al., 2001)	55																																																	
	Lack of Awareness	56																																																	
	Absence of Regulations and Policies	56																																																	
Climate change strategy	-																																																		
Relevance for decision-making	-																																																		
	However, this response is far from being uniform	46																																																	
	climate change represents one of the most serious environmental challenges faced by humanity today. Its causes and effects, as well as the potential solutions to this challenge, cut across every nation and sector of the economy, ultimately affecting every human being in one way or other (Hardy, 2003).	46																																																	
	even at more moderate levels of warming, the detailed studies of regional and sectoral impacts suggest that climate change will have serious impacts on world output,	46																																																	
Business relevance	With the growing consensus among scientists regarding the potential impacts of climate change, industries are under increasing pressure from investors, governments and environmental organizations to reduce their GHG emissions from their processes, products and services.	47																																																	
	However, this pressure varies from one country to another and across industrial sectors (Dunn, 2002).	47																																																	
	These models are generally based on the assumption that firms (should) improve their environmental performance and move upwards on the scale	49																																																	
Miscellaneous																																																			
Results	<table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="4">Cluster</th> </tr> <tr> <th>Indifferent</th> <th>Beginner</th> <th>Emerging</th> <th>Active</th> </tr> </thead> <tbody> <tr> <td>Internal activities</td> <td>0.79</td> <td>2.49</td> <td>1.77</td> <td>2.79</td> </tr> <tr> <td>Environmental & energy management activities</td> <td>1.16</td> <td>1.42</td> <td>2.09</td> <td>3.29</td> </tr> <tr> <td>External activities</td> <td>0.49</td> <td>2.01</td> <td>2.55</td> <td>2.65</td> </tr> <tr> <td>GHG management activities</td> <td>0.93</td> <td>1.24</td> <td>2.76</td> <td>3.00</td> </tr> <tr> <td>Total number of cases</td> <td>36</td> <td>52</td> <td>52</td> <td>39</td> </tr> <tr> <td>(%)</td> <td>(20.1%)</td> <td>(29.1%)</td> <td>(29.1%)</td> <td>(21.8%)</td> </tr> <tr> <td>Pakistani firms</td> <td>19</td> <td>37</td> <td>11</td> <td>4</td> </tr> <tr> <td>UK firms</td> <td>17</td> <td>15</td> <td>41</td> <td>35</td> </tr> </tbody> </table>		Cluster				Indifferent	Beginner	Emerging	Active	Internal activities	0.79	2.49	1.77	2.79	Environmental & energy management activities	1.16	1.42	2.09	3.29	External activities	0.49	2.01	2.55	2.65	GHG management activities	0.93	1.24	2.76	3.00	Total number of cases	36	52	52	39	(%)	(20.1%)	(29.1%)	(29.1%)	(21.8%)	Pakistani firms	19	37	11	4	UK firms	17	15	41	35	52
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UK firms	17	15	41	35																																															
	To classify companies based on their climate change activities, a cluster analysis was conducted using the rescaled factor scores of these four variables resulting from factor analysis in two steps (Hair et al., 2006).	52																																																	

	The analysis shows that there are significant differences with respect to country, sector, size and type of ownership	53
	This empirical study has shown that corporate response for climate change can be characterized for Pakistan and the UK on a continuum scale in four categories: 'indifferent', 'beginner', 'emerging' and 'active'. In the UK, where government has engaged industries through various policy measures, business has started to respond by adopting 'emerging or 'active' strategies	57
	Understanding of drivers and barriers to environmental activities faced by the firm helps in making sense of firms' responses. The findings of this study suggest that firms' responses depend on the location, sector, size and type of ownership, as stakeholder pressures on industry, the drivers and barriers for taking actions vary between countries and across industrial sectors, size and specific type of the industrial operations.	57
Criticism / Limits	-	
	Often action is predicated on economic, technological, organizational and institutional drivers and barriers, which vary between countries and across industrial sectors.	47
	In summary, industry response does vary significantly between sectors, between industries within the same sector and between countries. The main factors suggested to cause these differences include regulatory pressure, societal demand, market positioning and economic conditions, accessibility to alternative technologies etc. (Whittaker, 2004; van der Woerd et al., 2000)	48
Other important facts	A review of the various models shows that, irrespective of whether the models are continuum or typologies, most lack sufficient details or criteria to operationalize them. In addition, they are mostly derived from theory by way of deduction and the empirical evidence or history is opaque at best. This turns these models into normative, as opposed to descriptive or analytical, constructs.	49
	The recent Stern report concluded 'the benefits of strong and early action far outweigh the economic costs of not acting' (Stern, 2006, p i)	57
	As emissions from developing countries are likely to exceed those from the developed countries in the next 20 years (IPCC, 2001), developing countries will be faced with the enormous challenge of reducing emissions without compromising their economic development.	57
Further research investigations	Further research is needed to operationalize the developed research framework in the contexts of both developing and industrialized countries to better understand the corporate strategies.	57

		25
Name	Johnstone	
First Name	Kay	
Title	Chapter 15: adapting to climate change, in: Managing climate risk: a practical guide for business	
Year	2008	
Co-Authors	-	
Type of Article	Book chapter	
Published by	Thorogood Publishing Ltd	
Initiated by	Research Centre	
Ref.-type	Book chapter	
Journal		
Volume	-	
Issue	-	
pages	129-137	
Level of examination	-	
Country of origin	UK	
Subject	Business, Environmental Science	
Industry sector	-	
Country	UK	
Continent	Europe	
Ranking		
ISI-Factor	-	
VHB JQ2	-	
Handelsblatt	-	
Source	BSC	
Search term	"adaptive capacity" AND climat* change AND strategy AND compan*	
Abstract	Chapter 15 of the book "Managing Climate Risk: A Practical Guide for Business," edited by Adam Jolly is presented. It highlights the statements of Kay Johnstone related to the actions in responding to climate change at the Climate Impacts Programme in Great Britain. It also presents a table which depicts two means on how climate change directly affects business, which include mitigation and adaptation.	
Code	Segment	Page
Aim of article	-	
Adaptive capacity		
	Adaptation measures include those that involve delivering adaptation actions and those that build adaptive capacity	135
Definition	Adaptive capacity, on the other hand, is the information, social capital and supportive conditions that are needed as a foundation for delivering adaptation actions. UKCIP's adaptation actions database contains details of existing adaptation activities of all types	135
Thesaurus	-	
Characteristics	However, the consequence for an individual business depends on many factors including location, process, market position and business priorities	133
Adaptation	Adaptation: Responding to the projected impacts of climate change in order to reduce their adverse effects. Examples of adaptation measures include flood protection, improved summer cooling and business continuity planning.	130
	Climate change is not a one-off event but is a continuous process of change in the context of many socio-economic changes. Adaptation to climate change must also therefore be a dynamic process.	135
Strategy		
Strategy development	Most adaptation measures can be integrated with other systems and procedures, such as the existing risk register, health and safety arrangements, quality management, business continuity planning or strategic	136

	planning	
Climate change strategy	-	
Relevance for decision-making	-	
	Climate change cannot be avoided in the short-term. This is because of the long lifetime of CO ₂ in the atmosphere, so that the warming we are experiencing now is a result of emissions from the last century	129
	adaptation is crucial, regardless of how successful we are at reducing greenhouse gas emissions	129
Business relevance	The past is full of examples of how the weather can disrupt economic activity. In 2006 more than 50% of UK business suffered disruption as a result of extreme weather. Storms at the end of November caused widespread disruption, while heatwave conditions in the summer forced some to shut down computers or close offices (Woodman, 2007).	130
	Single weather events, such as these, cannot be attributed to climate change. However, it is known that climate change will drive an increasing frequency of such events (Hulme et al., 2002).	130
	SMEs are potentially more vulnerable to the climate risk than larger companies, having fewer resources to withstand the impacts (Howlin and Ezingard, 2005)	131
	It is true that in many cases the impacts of climate change on a business may be insignificant compared with other business risks	133
Miscellaneous		
Results	-	
Criticism / Limits	-	
Other important facts	-	
Further research investigations	-	

Name	Judge
First Name	William Q.
Title	Organizational capacity for change and firm performance in a transition economy
Year	2009
Co-Authors	Naoumova, I.; Douglas, T.
Type of Article	Research Paper
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Ref.-type	Journal article
Journal	International Journal of Human Resource Management
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Level of examination	Organization
Country of origin	USA
Subject	Management, Business, HR
Industry sector	-
Country	Russia
Continent	Asia
Ranking	
ISI-Factor	0.830
VHB JQ2	B
Handelsblatt	0.4
Source	BSC
Search term	"adaptive capacity" AND environment* change AND strategy AND business

Abstract This study explored some human resource and human systems' aspects of the competitive dynamics for firms attempting to survive and prosper within Russia, a highly volatile transition economy. Overall, this study adds to our understanding of international strategic human resource management, dynamic capabilities, and the generation of competitive advantage within transition economies. We found that a relatively new construct derived from the dynamic capabilities and organizational change literatures, known as 'organizational capacity for change,' is positively associated with firm performance within a wide variety of Russian firms. Furthermore, we find that the relationship between organizational capacity for change and firm performance is stronger when there are relatively high levels of uncertainty with the task environment. Finally, we found that organizational capacity for change is an important attribute in all sizes of organizations, not just for large organizations as hypothesized.

Code	Segment	page
	Consequently, this study seeks to explore the nature of overall organizational change capacity and competitive advantage in a wide variety of industries and regions within Russia, a complex and rapidly changing transition economy.	1738
Aim of article	While there are increasing calls for organizations to develop their capacity for change in all contexts (Meyer and Stensaker 2006), it is possible that the best opportunities for advancing theory and research on organizational change may lie in the study of organizations operating within transition economies (Meyer and Gelbuda 2006).	1738
Adaptive capacity		
	Clearly, an organization's ability to adapt and change is sorely tested during institutional upheavals in transition economies (Zhou, Tse and Li 2006).	1739
	This 'adaptive capacity' is the promise and the potential behind the organizational capacity for change construct and measure.	1749
Definition	As Staber and Sydow (2002) astutely argue, within highly volatile and unpredictable environments (such as transition economies), 'the idea is not to seek the "optimal fit" to existing contingencies, as with traditional adaptationist strategies, but to endure some resource slack supporting a repertoire of potential solutions to unforeseen problems' (p. 409)	1749

	We give particular attention to a new dynamic capability known as organizational capacity for change	1738
	To do so, we turn to the resource-based view for insights (Barney 1997), one of the primary theoretical lens from which organizations are studied in these environments (Meyer and Peng 2005)	1739
	Dynamic capabilities consist of a set of specific and identifiable processes that, although idiosyncratic to firms in their details and path dependent in their emergence, allow the organization to generate new, value-creating strategies (Eisenhardt and Martin 2000).	1739
Thesaurus	A promising new dynamic capability that has been developed and tested within transition economies is known as 'organizational capacity for change'; hereinafter referred to as 'OCC'. Judge and Elenkov (2005) conceptualize OCC as a 'dynamic organizational capability that allows the enterprise to adapt old capabilities to new threats and opportunities, as well as create new capabilities' (p. 893).	1739
	More specifically, it is defined as the dynamic resource bundle comprised of effective human capital at varying levels of a business unit, with cultural predispositions toward innovation and accountability, and organizational systems that facilitate organizational change and transformation.	1739f
	Within the organizational theory literature, OCC is perhaps most similar to Cohen and Leventhal's (1990) 'absorptive capacity' as both constructs are conceptualized as dynamic capabilities that characterize how organizations adapt and change.	1740
	In essence, OCC may represent a comprehensive 'meta-capability' that enables an enterprise to regain or remain competitive with other enterprises through effective leadership, adaptive cultures, resilient employees, and an organizational infrastructure conducive to change.	1740
Characteristics	Within the resource-based view, resources are classified as tangible, intangible, and personnel-based (Grant 1992). [...] Recent resource-based research has shown that some of the most valuable and rare organizational capabilities are known as 'dynamic capabilities.'	1739
	However, absorptive capacity focuses exclusively on organizational routines and processes; while OCC focuses on organizational routines and processes as well as leadership talent and employee attitudes.	1740
	Organizational change is always messy and complex due to the human emotions involved and nonlinear interdependencies within organizations.	1741
Adaptation	Furthermore, Newman (2000) asserts that extreme forms of institutional upheaval can actually hinder organizational adaptability and change	1738
	Previous research has shown that dynamic capabilities are intimately associated with organizational adaptation and innovation (Verona and Ravasi 2003)	1739
Strategy		
Strategy development	As Chakravarthy (1982) observed, the essence of strategic management is coping with change, and this is especially important in a transition economy (May, Stewart and Sweo 2000).	1740
	Finally, strategies often 'emerge' within highly uncertain environments and these strategies require highly adaptable and rather robust organizations (Parnell, Lester and Menefee 2000)	1741
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	Notably, Peng and Heath (1996) argue that due to the institutional turbulence of these transition economies, strategic choice is fundamentally different than in developing countries	1737f
	When the 'rules of the game' are changing quickly and in unpredictable ways, new organizational capabilities are needed, and dynamic capabilities through organizational learning, innovation, and adaptation are required (Newman 2000).	1738
	Within transition economies, the organization's ability to adapt and change is essential to firm performance and survival (Staber and Sydow 2002).	1740
	Clearly, an organization's ability to adapt and change within this transition economy seems likely to be essential for survival and prosperity.	1743
Miscellaneous		
Results	What all these studies have in common is that they all represent various aspects of internal resource bundles involving strategic leadership, organizational culture, and/or organizational infrastructure.	1739
	In this study, OCC was found to be positively related to the firm's overall financial performance in Russia	1748
	Specifically, the relationship between OCC and firm performance is stronger when PEU is also high. This finding suggests that when a strategic leader is confronted with extraordinary uncertainty in the task environment within a transition economy, s/he is more likely to realize superior firm performance by enhancing and better utilizing the organization's capacity for change.	1748

	Interestingly, we did not find that organizational size moderated the relationship between organizational change capacity and firm performance. This suggests that OCC may be a valuable and rare dynamic capability in organizations of all sizes, not just in organizations of a certain size	1749
	The managerial implications of this research are clear: seek to develop your organizational capacity for change within transition economies if you want to survive and indeed prosper.	1748
Criticism / Limits	Strictly speaking, our firms were not selected randomly. As such, the findings may or may not be generalizable to all of Russia let alone all transition economies.	1748
	While efforts were made to verify and expand the generalizability of our sample, there frankly is little reliable and up-to-date demographic data about Russian managers, particularly with respect to age. Second, our study was cross-sectional in nature. As such, causal directions are theorized, but the only way to really be more confident of our findings is to perform a longitudinal study of these relationships.	1748
Other important facts	In recent years, human resource managers have been encouraged to play a more strategic role in their organizations, especially in the case of making the firm more competitively adaptable and innovative (Boudreau 2006).	1737
	previous research has only examined aspects of organizational change capacity such as control systems (Liao 2006), or human capital (Hitt, Bierman, Shimizu and Kochlar 2001) without considering overall organizational change capacity	1738
	Indeed, the environmental context can influence the relative effectiveness of firm capabilities (Wan 2005). This is particularly true for dynamic capabilities which may be predicated on the basis of the firm operating within a dynamic and volatile task environment (Zahra, Sapienza and Davidson 2006)	1740
	According to the resource-based perspective, organizational size can influence the organizational change process through core rigidities and organizational inertia (Leonard-Barton, 1992)	1742
Future research investigation	Clearly, further study is merited on the OCC construct, and further exploration in other transition economies is in order	1749

		27
Name	Klarner	
First Name	Patricia	
Title	From change management to the management of organizational change capacity: a conceptual approach	
Year	2007	
Co-Authors	Probst, Gilbert; Soparnot, Richard	
Type of Article	Working Paper	
Published by	URL: http://www.hec.unige.ch/recherches_publications/cahiers/2007/2007.01.pdf	
Initiated by	University	
Ref.-ID	4600	
Ref.-type	Website	
Journal		
Volume	-	
Issue	-	
pages	-	
Level of examination	Organization	
Country of origin	France	
Subject	Management, Organization	
Industry sector	Manufacturing	
Country	-	
Continent	-	
Ranking		
ISI-Factor	-	
VHB JQ2	-	
Handelsblatt	-	
Source	Google Scholar	
Search term	strategic management AND "adaptive capacity"	
Abstract	<p>In an increasingly dynamic business environment, organizations have to constantly change in order to develop and survive. Organizational change capacity is considered a solution to the question: how can sufficient adaptation to internal and external changes be achieved and managed? However, while an upcoming literature stream deals with the characterization of change capacity, the understanding of the construct is still underdeveloped. This conceptual paper therefore tries to develop a conceptual model of change capacity. It thereby contributes to the literature in several ways: First, it presents a review and classification of existent approaches to change capacity. Second, a more holistic understanding of the construct is required, which is why this paper combines the existent perspectives within a definition. Third, a conceptual model of change capacity is presented that builds on a case study on change capacity's preliminary findings and enhances them with theoretical arguments. Understanding what change capacity is about will allow companies to better deal with its determinants and consequently increase the organizational level of adaptation and ultimate survival.</p>	
Code	Segment	Page
	This conceptual paper therefore tries to develop a conceptual model of change capacity	3
	Instead, the conflicting paradigms raise a much broader issue: Assuming that successful companies are able to change pro-actively and/or adapt to internal and external evolution, how can this ability be defined? This question leads us to a deeper analysis of organizational change capacity	6
Aim of article	What are organizational change capacity's main underlying dimensions? How can each dimension be characterized?	6
	we will focus on changes in organizational strategy, structure and culture. We have chosen these three content types, because the organizational change and development literature often stresses that successful companies change their strategy, structure and culture over time in order to adapt to internal or external evolution (e.g. Hendry & Pettigrew, 1992; Kuwada, 1998).	23
Adaptive capacity		
Definition	While adaptation is regarded as equilibrium-seeking behavior that maximizes fit with existing conditions, adaptive capacity is defined as "the ability to cope with unknown future circumstances".	13

	Organizations are regarded as having adaptive capacity when “learning takes place at a rate faster than the rate of change in the conditions that require dismantling old routines and creating new ones”	13
	Organizational change capacity is considered a solution to the question: how can sufficient adaptation to internal and external changes be achieved and managed?	3
	If, conversely, the deterministic approach holds true, organizational change capacity is limited due to the environment’s internal and external constraints (Delacroix & Swaminathan, 1991) and is, at best, an adaptive capacity	6
Thesaurus	“a broad and dynamic organizational capability that allows the enterprise to adapt old capabilities to new threats and opportunities as well as create new capabilities”.	9
	This leads us to a more holistic definition of change capacity than those existent in the literature: Organizational change capacity is the organization’s ability to develop and implement (change process perspective) appropriate organizational changes (change content perspective) to constantly adapt to environmental evolutions (external context) and/or organizational evolutions (internal context) in either a reactive way (adaptation) or by initiating it (pro-action).	14f.
	Context determinants are forces or conditions within an organization’s external and internal environments that can enable or hinder change (e.g. Armenakis & Bedeian, 1999). Process determinants refer to actions undertaken during the enactment of an intended change (Armenakis & Bedeian, 1999).	8
	following context determinants of change capacity: trustworthy leadership, trusting followers, capable champions, involved midmanagement, an innovative culture, an accountable culture, systems communications, and systems thinking.	9
Characteristics	Process determinants. In contrast to the above, Meyer & Stensaker (2006) adopt a process perspective of change capacity. They define capacity for change as “the allocation and development of change and operational capabilities that sustains long-term performance”	10
	Process and context determinants. McGuinness & Morgan (2005) use a process perspective and define organizational change capability as an organization’s “capability of implementing incessant change” and “a capability for leading and managing a cascading series of inter-related change initiatives that are consistent with an intended type of strategy dynamics”	12
Adaptation		
Strategy		
Strategy development	Strategic change is defined as change in a company’s product-market strategic orientation, which can be applied to the corporate as well as to the business unit level (Ginsberg, 1988; Kelly & Amburgey, 1991; Rajagopalan & Spreitzer, 1997)	23
Climate change strategy	-	
Relevance for decision-making	-	
	In an increasingly dynamic business environment, organizations have to constantly change in order to develop and survive	3
Business relevance	We consequently argue that companies have to adapt their strategies over time, which is why change capacity should be studied in respect of strategic changes	24
Miscellaneous		
Results	The few existent studies that analyze change capacity in more detail can be classified as having a focus on either its context or process determinants, or both	8
Criticism / Limits	-	
	On the one hand, population ecologists emphasize environmental determinism, which forces an organization to adapt to a set of given constraints over time (Carroll, 1984; Greenwood & Hinings, 1996; Hannan & Freeman, 1989). On the other hand, the strategic choice paradigm emphasizes managerial action and views adaptation as an outcome of managerial choice (Child, 1972; Greenwood & Hinings, 1996; Lorange, 1980; Pfeffer & Salancik, 1978; Soparnot, 2006).	5
Other important facts	It is therefore necessary to establish continuous change (Brown & Eisenhardt, 1997) in order to make change an ability embedded in the organizational context. This ability can be compared to an organizational learning capability (e.g. Argyris & Schön, 1996; March, 1991).	9
	“doing what one has always done is necessary in short-term adaptation. Doing what one has never done is necessary in long-term adaptation and both are necessary simultaneously”	9
Further research investigations	-	

		28
Name	Koberg	
First Name	Christine S.	
Title	Resource, environmental uncertainty, and adaptive organizational behavior	
Year	1987	
Co-Authors	-	
Type of Article	Research Paper	
Published by	Academy of Management	
Initiated by	University	
Ref.-ID	4719	
Ref.-type	Journal article	
Journal	Academy of Management Journal	
Volume	30	
Issue	4	
pages	798-807	
Level of examination	Organization	
Country of origin	USA	
Subject	Management, Business	
Industry sector	-	
Country	-	
Continent	-	
Ranking		
ISI-Factor	6.438	
VHB JQ2	A+	
Handelsblatt	1	
Source	Journal	
Search term	Searched within Journal	
Abstract	The article provides information on a study which investigated the effects of environmental uncertainty and resource scarcity in interaction with organizational structure on the categories of organizational adjustments. The author presents a description of adaptation and methods used in the study. Details related to the relationship between environmental uncertainty and adaptive organizational behavior in corporations is presented. The article focuses on various organizational adjustments including procedural, personnel, process, and strategic.	
Code	Segment	page
Aim of article	This study investigated the effects of both uncertainty and resource scarcity, in interaction with organizational structure, on five broad categories of organizational adjustments: procedural, personnel, process, structural, and strategic.	798
Adaptive capacity		
Definition	-	
Thesaurus	An organic structure, with its low degree of formality and high degree of information sharing and decentralization, enhances an organization's flexibility and ability to adapt to continual environmental change and uncertainty (Mintzberg, 1979).	799
Characteristics	Organizational structure was determined by Hage and Aiken's (1969) three perceived measures of nonformalization: absence of rules and procedures ("There is no operating rules manual"), participatory decision making, and decentralization of the hierarchy of authority ("A person who wants to make his/her own decisions would be quickly discouraged").	801
Adaptation	Adaptation is a general term for the process of accommodation between an organization and its environment (Lawrence & Dyer, 1983). Described as a period of gradual, long-continued, and incremental change in response to environmental conditions (Tushman & Romanelli, 1985),	798
	Adaptational changes can differ greatly in breadth and cost and can affect an organization's control systems, structure, allocation of resources, strategy, and core values and beliefs (Tushman & Romanelli)	798
	Adjustments are explained by disruptive resource instabilities and the inabilities of organizations to acquire	799

	and control critical and scarce resources (Aldrich, 1979). The effects of environmental uncertainty and resource scarcity on an organization are a stream of adaptive organizational acts (Lawrence & Dyer)	
	five categories of adjustments: These are the five categories, arranged in ascending order of scope and cost, with an example of each type: procedural, changes in rules and work procedures; personnel-related, hiring and firing of employees; process, changes in budget allocations; structural, creation or elimination of departments; and strategic, changes in basic instruction or services offered.	801
Strategy		
	environmental conditions interact with the form or structure of an organization to facilitate or impede adaptive organizational behavior. They considered an organic structure to be generally the best suited to coping with or adapting to a turbulent environment.	799
Strategy development	Among five broad types of organizational adjustments, arranged in ascending order of scope and cost—procedural, personnel, process, structural, and strategic—the less costly will occur with significantly greater frequency than will the more costly.	798
Climate change strategy	-	
Relevance for decision-making	The use of uncertainty as an environmental variable flows from an information-processing view of organizations that treats environments as a source of information (Galbraith, 1973; Lawrence & Lorsch, 1967). Scholars taking such a view explain organizational adjustments by variations in information, as filtered by managerial perceptions of their external environment (Lawrence & Lorsch, 1967)	798f.
Business relevance	Studies of environmental influences on adaptive organizational behavior have generally focused on two major aspects of the environment. One is environmental uncertainty as perceived by managers (Lawrence & Lorsch, 1967; Yasai-Ardekani, 1986), and the other is scarcity of critical resources (Pfeffer & Salancik, 1978), especially during periods of slow economic growth (Ansoff, 1979) [...] most research has investigated the effects of only one of the two.	798
Miscellaneous		
	Perceived environmental uncertainty was associated with the frequency of all organizational adjustments—with the exception of strategic adjustments—and environmental resource scarcity was associated with the frequency of process, structural, and strategic adjustments.	802
	Uncertainty was the strongest contributor to procedural adjustments, and resource scarcity was the strongest contributor to the frequency of process, structural, and strategic adjustments. Contrary to Hypothesis 3, the incremental addition of the three-way interaction term produced no significant interaction effect.	802
	The results of the present study are consistent with the notion of organizational adaptation as incremental or successive change in a wide range of organizational activities (Miller & Friesen, 1980; Tushman & Romanelli, 1985),	804
Results	they suggest that there is a hierarchy of adaptive organizational responses.	804
	least costly occurred most frequently, and the most costly occurred least frequently.	804
	that both organizational/managerial and environmental elements determine adaptation.	804
	Although organization and environment are both important for understanding adaptation, changes in managers' perceptions of uncertainty and changes in available resources may generate different types of organizational adjustments.	805
	An environment where adequate resources are lacking, however, can pose a far greater and longer lasting threat to an organization. Changes in available resources may require broad changes in the structure and strategy of an organization.	805
Criticism / Limits	represent only a single type of organization	804
Other important facts	Although simultaneous changes during periods of adaptation are possible, the principle of minimum intervention found in the literature on strategy suggests that policy makers who are intendedly rational will attempt to choose courses of action that solve their problems with minimal financial and human cost to their organizations (Hrebiniak & Joyce, 1984).	798
	Environmental uncertainty refers to the extent to which organizational decision makers perceive unpredictable changes in their external environment.	800

		29
Name	Kolk	
First Name	Ans	
Title	Winds of change: corporate strategy, climate change and oil multinationals	
Year	2001	
Co-Authors	Levy, David	
Type of Article	Research Paper	
Published by	Pergamon Press	
Initiated by	University	
Ref.-ID	4731	
Ref.-type	Journal article	
Journal	European Management Journal	
Volume	19	
Issue	5	
pages	501-509	
Level of examination	Organization	
Country of origin	Netherlands	
Subject	Business, Strategy, Environmental	
Industry sector	Mining & Quarrying	
Country	Cross-country	
Continent	Worldwide	
Ranking		
ISI-Factor	-	
VHB JQ2	C	
Handelsblatt	0.3	
Source	Google Scholar	
Search term	Searched within reference list	
Abstract	Analyzes developments in the oil industry, observing considerable shifts in corporate climate strategies. Implementation of climate policies; Impact on the industry of the economic situation of oil multinationals; Changes in corporate structures.	
Code	Segment	Page
	It also develops a typology of climate strategies that addresses the market dimensions, covering both the aim (strategic intent) and the degree of cooperation (form of organisation)	304
Aim of article	This article analyses developments in the oil industry over the past few years, observing considerable shifts in corporate climate strategies. It compares British Petroleum, Royal Dutch Shell, Texaco and ExxonMobil, of which currently only the latter strongly opposes a climate treaty	304
Adaptive capacity		
Definition	-	
Thesaurus	-	
Characteristics	-	
Adaptation	-	
Strategy		
	Company strategies can only be explained from a combination of distinct traditions, backgrounds and idiosyncracies, which will be analysed in this article following the elements summarized in Table 2	305
Strategy development	-	

	With increasing regulatory and public pressure, the climate strategies of most oil companies have started to change	304								
Climate change strategy	<p>Table 2 Important Explanatory Factors for Corporate Positions on Climate Change</p> <table border="1"> <thead> <tr> <th>Factors</th> <th>Components</th> </tr> </thead> <tbody> <tr> <td>Locational factors</td> <td>Societal concerns about climate change in home country Societal perceptions about scientific uncertainties Societal views on the behaviour of oil companies Regulatory culture (litigational or consensus-oriented) National policies on climate change</td> </tr> <tr> <td>Economic and market position</td> <td>Company financial and economic situation Competitive, market positioning Role of long-term scenario planning History of involvement with renewables</td> </tr> <tr> <td>Internal organizational factors</td> <td>Degree of (de)centralization Position of CEO Availability and type of internal climate expertise Type of decision-making process Corporate culture</td> </tr> </tbody> </table>	Factors	Components	Locational factors	Societal concerns about climate change in home country Societal perceptions about scientific uncertainties Societal views on the behaviour of oil companies Regulatory culture (litigational or consensus-oriented) National policies on climate change	Economic and market position	Company financial and economic situation Competitive, market positioning Role of long-term scenario planning History of involvement with renewables	Internal organizational factors	Degree of (de)centralization Position of CEO Availability and type of internal climate expertise Type of decision-making process Corporate culture	306
	Factors	Components								
	Locational factors	Societal concerns about climate change in home country Societal perceptions about scientific uncertainties Societal views on the behaviour of oil companies Regulatory culture (litigational or consensus-oriented) National policies on climate change								
Economic and market position	Company financial and economic situation Competitive, market positioning Role of long-term scenario planning History of involvement with renewables									
Internal organizational factors	Degree of (de)centralization Position of CEO Availability and type of internal climate expertise Type of decision-making process Corporate culture									
Relevance for decision-making	-									
Business relevance	From a business perspective, companies can try to seize possible economic opportunities arising from the climate issue by reducing risks and costs, anticipating regulation, developing green capabilities through new products or markets, and strategic behaviour vis-a-vis competitors (Kolk, 2000; Reinhardt, 2000a; Rugman and Verbeke, 2000)	304								
Miscellaneous										
	the timing, pace and types of responses have varied enormously	304								
Results	It has been hypothesized that the trans-Atlantic divide might be an important factor for explaining corporate positions on climate change (Rowlands, 2000). As examined in more detail below, a US –European comparison shows differences in the overall socio-cultural and political contexts, especially related to the timing of societal concerns for climate change, corporate reactions and interactions with stakeholders, including policymakers	306								
	Building internal expertise is not deemed necessary or seen as useful, inter alia because oil industry scientists would not be considered as very reliable sources of information by outsiders. These three companies do have internal networks and climate teams, but these were created more than a decade later than Exxon's.	309								
	Exxon's tradition, structure and strategy-making process seems to have made it more prone to insular thinking than a decentralized company such as Shell. Decentralization helps to bring in more international perspectives, offering opportunities for more open decision-making and corporate change. In addition, Shell's scenario-based planning deliberately sets out to contemplate radical environmental changes and pressures, and to challenge conventional thinking at the senior management level	309								
Criticism / Limits	-									
Other important facts	-									
Further research investigations	-									

		30
Name	Kolk	
First Name	Ans	
Title	Market strategies for climate change	
Year	2004	
Co-Authors	Pinkse, Jonatan	
Type of Article	Research Paper	
Published by	Pergamon Press	
Initiated by	University	
Ref.-ID	4709	
Ref.-type	Journal article	
Journal	European Management Journal	
Volume	22	
Issue	3	
pages	304-314	
Level of examination	Organization	
Country of origin	Netherlands	
Subject	Business; Management	
Industry sector	Cross-sector	
Country	Cross-country	
Continent	-	
Ranking		
ISI-Factor	1.983	
VHB JQ2	C	
Handelsblatt	0.5	
Source	Google Scholar	
Search term	Searched within reference list	

Abstract The issue of climate change has attracted increasing business attention in the past decade. Whereas companies initially aimed primarily at influencing the policy debate, corporate strategies increasingly include economic responses. Existing classifications for climate change strategies however still reflect the political, non-market components. Using empirical information from the largest multinational companies worldwide, this article examines current market responses, focusing on the drivers (threats and opportunities) and the actions being taken by companies to address climate change. It also develops a typology of climate strategies that addresses the market dimensions, covering both the aim (strategic intent) and the degree of cooperation (form of organisation). The aim turns out to be either innovation or compensation, while the organisational arrangements to reach this objective can be oriented at the company level (internal), at companies' own supply chain (vertical) or at cooperation with other companies (competitors or companies in other sectors — horizontal). The typology can assist managers in deciding about the strategic option(s) they want to choose regarding climate change, also based on the insights offered by the paper about the current state of activities of other companies worldwide.

Code	Segment	Page
Aim of article	It also develops a typology of climate strategies that addresses the market dimensions, covering both the aim (strategic intent) and the degree of cooperation (form of organisation)	304
Adaptive capacity		
Definition	-	
Thesaurus	-	
Characteristics	-	
Adaptation	-	
Strategy		

	Aim			
	Organisation	Innovation	Compensation	
	Internal(company)	Process improvement	Internal targets, control and trading	312
	Vertical(supply chain)	Product development	Supply chain targets, control and trading	
	Horizontal(beyond the supply chain)	New product/market combinations	External market mechanisms	
	A first step towards more sophisticated action on climate change is an inventory of greenhouse gas (GHG) emissions			318
	Although target-setting and monitoring with respect to GHG emissions is considered as a first step in a climate strategy, this does not fully reveal the current state of companies' business practices			319
Strategy development	Internal measures to reduce GHG emissions mainly consist of changes in the production process enabled by technological developments.			319
	Supply-chain Measures Various companies have started to consider emissions of their supply chain (upstream and/or downstream).			320
	Measures beyond the Supply Chain Recent public policy developments have led companies to seek climate change solutions beyond the borders of their internal organization and supply chain			320
Climate change strategy	-			
Relevance for decision-making	-			
Business relevance	Climate change is an international environmental issue that has increasingly attracted business attention in the past decade, because of its actual or potential strategic impact on many companies			304
Miscellaneous				
	The overwhelming majority of companies expect to increase their competitiveness as a result of climate change through process innovation or product development			304
Results	On the whole, respondents emphasise the business opportunities related to climate change rather than the risks			304
	One quarter of the companies refer to weather-related events. This factor is most salient for insurance and food and beverages and, to a lesser extent, finance and securities.			304
Criticism / Limits	-			
Other important facts	-			
Further research investigations	-			

		31
Name	Korbangyang	
First Name	S.	
Title	Organizational adaptability competency and its antecedents and consequences: An Empirical Investigation of Hotel Businesses in Thailand	
Year	2010	
Co-Authors	Ussahawanitkakit, P.	
Type of Article	Research Paper	
Published by	International Academy of Business and Economics	
Initiated by	University	
Ref.-ID	4656	
Ref.-type	Journal article	
Journal	Journal of International Business & Economics	
Volume	10	
Issue	2	
pages	1-27	
Level of examination	Organization	
Country of origin	Thailand	
Subject	Management, Business	
Industry sector	Hotels & Restaurant	
Country	Thailand	
Continent	Asia	
Ranking		
ISI-Factor	-	
VHB JQ2	-	
Handelsblatt	-	
Source	BSC	
Search term	Dynamic capabilities AND construction	
Abstract	<p>Business is confronting with continuous change. The success of business is bases on organizational adaptability competency to rapid respond environmental change. It is important to long-term survival and improving organizational performance. The purpose of this research is to examine the relationships among organizational adaptability competency and organizational performance through the operational achievement, corporate innovation and value creation. Long-term orientation, dynamic learning culture and intensive competitive environment are hypothesized to become the antecedents of organizational adaptability competency. Moreover, the study also investigates the moderating role of intra-communication efficiency and outstanding organizational support. The model is tested using data collected from mail survey of hotel businesses (three to five-star levels) in Thailand. Overall, the results indicate that organizational adaptability competency have indirectly positive impact on organizational performance via operational achievement, corporate innovation and value creation as the mediators but not directly impact on organizational performance. For the two moderators, intracommunication efficiency is a partial moderator of long-term executive vision, dynamic learning culture-organizational adaptability competency relationships. Outstanding organizational support is also a partial moderator of organizational adaptability competency-the consequences relationships.</p>	
Code	Segment	Page
Aim of article	The purpose of this research is to examine the relationships among organizational adaptability competency and organizational performance through the operational achievement,	1
	Thus, the key research question of this research is how organizational adaptability competency has an impact on organizational performance.	2
Adaptive capacity		
Definition	-	
Thesaurus	Organizational adaptability refers to modifications and alterations in the organization or its components in order to adjust to changes in the external environment. Its purpose is to restore equilibrium to an imbalanced condition (Cameron, 1984).	1

	However, some authors use definition concept with various terms such as adaptability, flexibility and versatility. Therefore, an ability of the enterprise to respond to unpredictable changes and how to deal	1
	with uncertain environment include notion of adaptive organization, agile organization and flexible organization.	2
	The authors use them synonymously with all terms meaning the ability to adjust and respond to change effectively (Phillips and Wright, 2009).	2
	In this study, dynamic capability is applied to encourage firms to adapt in changing environment. Organizational adaptability competency is assumed as organization adapt existing competency continuously through utilizing firm specific resources in response to the dynamic environment that change over time.	4
	Organizational adaptability competency refers to the specific capability of the firm to adjust and response successfully to environmental change.	4
Characteristics	This study focuses on four dimensions of organizational adaptability characteristics, including change learning capability, operational flexibility orientation, corporate practice proactiveness and valuable business reaction.	2
Adaptation	Some authors posit that adaptation is a core competency and critical factor in survival and success. It has strategy instead of operative character (Ivens, 2005).	1
	However, the goal of core competencies is to enable quick adaptation. Thus, it acts as the key to success in turbulent environment (Evans and Schulman, 1992; Lee, 2001).	1
Strategy		
Strategy development	This study views organizational adaptability competency as strategic focus rather than behavioral change of an individual in organization in order to investigate for the impact of organizational adaptability competency on subsequent business success such as operational achievement, corporate innovation and value creation which can have profundity on organizational performance	2
	Proactive behavior in organization is increasingly important for organizational success. Today environment becomes highly complex and turbulence. Reactive strategy sole does not assure for success in the long-run. Organization needs for proactive behavior incorporating into corporate practice to continuously staying ahead of the competition (Crant, 2000)	6
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	Business is confronting with continuous change. The success of business is bases on organizational adaptability competency to rapid respond environmental change.	1
	Presently, organizations are characterized by change; the business environment is fast moving, turbulent and unpredictable becoming high velocity and hypercompetitive environment (Chen and Lin, 2004; Hatum and Pettigrew, 2004)	1
	Nowadays, organizational adaptability has received increased academic attention. For firm to survive and succeed in the turbulent and unpredictable environment, adaptability is assumed to be major importance that can be considered as a company-specific skill for enhance firms' competitiveness (Dreyer and Gronhaug, 2004).	2
	Adaptability has become the most important factor in achieving competitive advantage. Mainstream strategy literature already emphasizes the importance of aspect of adaptability as a precondition for successful business (Tuominen et al., 2004).	2
	The strategic orientation of the organization is a state variable that is changed by decisions made in the organization. Organization which adapts on an ongoing basis is more reliable (have lower variance in performance) than organization that remain stable over long periods of time (Hakonsson et al., 2009)	2
Miscellaneous		
Results	-	
Criticism / Limits	The limitation of this study is that it deals only with the perception of hotel business in Thailand	20
Other important facts	Firm resource and capability may evolve and change over time in an important way (Helfat and Peteraf, 2003).	1
	Adaptability concepts in organizational literature have not yet been well defined.	1
	listic and strategic approach which supersedes the traditional approach (Phillip and Wright, 2009). Because of the stability of competitive environment in 1960s and 1970s has been replaced by increasing uncertainty (Dreyer and Gronhaug, 2004)	2

	In literature, much effort is devoted to defining various type of adaptability covering various aspects (Dreyer and Gronhaug, 2004)	2
	In line with contingency of organization proposed in Lawrence and Lorsch's (1967) classic work, the basic assumption is that fit between a strategy and its context, such as its external environment or an organization structure that has a significant implication for performance (Tsang and Yip, 2007). Organizations must adjust their aims and shape in order to suit themselves to market and other environment characteristic.	4
	In this study, contingency theory is adopted to describe the relationship of organizational adaptability competency and organizational performance through operational achievement; corporate innovation and value creation which is depend on both external and internal environment.	4
	Previous studies often link of learning capability to business success. Organizational learning capability may allow firm to create value and to gain sustain competitive advantage	4
	Organizational learning capability involves transforming and exploitation the assimilated knowledge by incorporating it into the firm's operations thereby improving its performance (Lev et al., 2009).	5
Further research investigations	Future research should focus on other businesses which might provide different result from the findings of this research. Furthermore, future research should identify the other potential moderator to explain organization adaptability competency phenomenon.	20

Name	Korhonen
First Name	Jouni
Title	Beyond eco-efficiency: a resilience perspective.
Year	2008
Co-Authors	Seager, Thomas P.
Type of Article	Editorial
Published by	John Wiley&Sons, Inc.
Initiated by	University
Ref.-ID	4686
Ref.-type	Journal article
Journal	Business Strategy & the Environment
Volume	17
Issue	7
pages	411-419
Level of examination	Industry
Country of origin	Finland
Subject	Business, Strategy
Industry sector	-
Country	-
Continent	-
Ranking	
ISI-Factor	-
VHB JQ2	B
Handelsblatt	0,3
Source	BSC
Search term	"adaptive capacity" AND climat* change AND strategy AND compan*
Abstract	Business strategy with regard to sustainability is currently dominated by an eco-efficiency approach that seeks to simultaneously reduce costs and environmental impacts using tactics such as waste minimization or reuse, pollution prevention or technological improvement. However, in practice, eco-efficiency optimization rarely results in improved diversity or adaptability and consequently may have perverse consequences to sustainability by eroding the resilience of production systems. This editorial article contrasts a resilience approach with an eco-efficiency approach as they relate to strategic sustainable development. In some cases, the system attributes that are critically important to resilience – such as spare capacity, reserve resource stocks and redundancy – are in opposition to eco-efficiency. Our most important insight is the realization that investments in what may seem counter to eco-efficiency can nonetheless be important for sustainability.

Codings sheet due to technical reasons not integrated.

Code	Segment	Page
Aim of article	This editorial article contrasts a resilience approach with an eco-efficiency approach as they relate to strategic sustainable development.	411
Adaptive capacity		
	Strategies for adaptability in human systems may very well involve technology or reengineering, but on an adaptability trajectory the basic system state remains recognizable as having all the elements of the original state. Consequently, the two descriptions of adaptability may be interpreted as consistent with one another	413
Definition	‘Adaptability’ describes the ability of an organization to change practices, resource allocations, designs, relationships or other aspects of the business in response to changing conditions.	412
	Whereas Fiksel (2003) lists adaptability as part of resilience itself	413
Thesaurus	The advantage of an EE approach from a strategic business perspective is that it lends itself to measurable objectives that are consistent with a continuous improvement or quality-focused management culture	412

	In engineering, Fiksel (2003) lists diversity, efficiency, adaptability and cohesion as characteristic of resilience. 'Diversity' implies a wide range of alternatives, such as multiple product offerings or production sites. 'Efficiency' refers to resource productivity, including eco-efficiency	412
	Walker et al. (2004) draw a distinction between resilience, adaptability and transformability	413
	However, transformability describes a change into a very different state, from which the original state is unlikely to be accessible (i.e., the change is irrevocable)	413
	Nevertheless, each of these perspectives inevitably starts from the premise that the hazards are known, identifiable or quantifiable	413
	By contrast, the concept of resilience is detached from the necessity to describe a specific hazard	413
	Resilience is a more general approach to understanding how systems may respond and adapt under stress, such as intrusion of invasive species, outbreak of disease, loss of biomass or release of pollution	413
	Whereas a traditional risk-based perspective is appropriate for events that can be foreseen or forecasted under a business-as-usual scenario, the resilience perspective is concerned more with organizational response in the event of the unusual, unexpected and unforeseen	413
	analogous strategies for resilience are found at the level of a business organization	414
	such as raising new capital, reorganization of the corporate structure, relocation or product redesign	414
Characteristics	-	
Adaptation	-	
Strategy		
	As the locus of business concern expands from environmental management to sustainable development, so must the basis of environmental strategy expand from a risk to a resilience approach.	414
Strategy development	Although climate change is certainly a monumental stressor that may result in transformational change, history teaches us that our ignorance with regard to environmental risk by far exceeds our understanding.	417
	Therefore, a risk-based strategy to management of business enterprises, while necessary, is insufficient to ensure progress towards sustainability. We suggest that risk assessment and mitigation efforts be supplemented by investments that enhance system resilience.	417
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	-	
Miscellaneous		
	This editorial article of the Business Strategy and the Environment special issue on 'Strategic sustainability management' has introduced the concept of resilience to business strategy.	417
Results	Eco-efficiency has become perhaps the most popular concept and tool in corporate environmental and sustainability management and also in environmental policies of public organizations	417
	We have presented arguments that support investments to what can be defined as inefficiency in terms of the current eco-efficiency literature. Inefficiency may enhance economic system resilience and resilience of affected ecological systems.	417
Criticism / Limits	-	
	Business strategy with regard to sustainability is currently dominated by an eco-efficiency	411
	However, in practice, eco-efficiency optimization rarely results in improved diversity or adaptability and consequently may have perverse consequences to sustainability by eroding the resilience of production systems.	411
Other important facts	Interestingly, it remains a topic of debate whether the change required in business to achieve sustainability can be incremental, as suggested by the adaptability trajectory, or necessitates a radical paradigm shift, as suggested by a transformability pathway (Ayres, 2008; Ehrenfeld, 2000; Welford, 1998).	413
	Business strategists are generally familiar with the concept of risk	413
	but in the case of sustainability, risk may manifest in several dimensions: financial (such as the risk of counter-party default on contracts), environmental (such as worker and consumer safety from toxins) and socio-political (such as regulatory or market preference risks)	413

	In each case, it may be said that the previously dominant organization lacked the ability to adapt to changing technological and social conditions, resulting in an emergence of a new organization that transformed the system. It may be that in time Wal-Mart's position is also usurped by some other model	414
Further research investigations	-	
NACE	-	

Name	Levy
First Name	David L.
Title	Strategic responses to global climate change: conflicting pressures on multinationals in the oil industry
Year	2002
Co-Authors	Kolk, Ans
Type of Article	Research Paper
Published by	Berkeley Electronic Press
Initiated by	University
Ref.-ID	4720
Ref.-type	Journal article
Journal	Business & Politics
Volume	4
Issue	3
pages	275-300
Level of examination	Industry
Country of origin	USA
Subject	Management, Strategy, Environmental
Industry sector	Mining & Quarrying
Country	USA / Europe
Continent	North America / Europe
Ranking	
ISI-Factor	-
VHB JQ2	-
Handelsblatt	-
Source	BSC
Search term	corporate AND response AND climate change AND strategy
Abstract	MNCs are increasingly facing global environmental issues demanding coordinated market and non-market strategic responses. The home country institutional context and individual company histories can create divergent pressures on strategy for MNCs based in different countries; however, the location of MNCs in global industries and their participation in 'global issues arenas' create issue-level fields within which strategic convergence might also be expected. This paper analyzes the responses of oil MNCs to climate change and finds that local context influenced initial corporate reactions, but that convergent pressures predominate as the issue matures.
	<i>Codings sheet due to technical reasons not integrated.</i>

Name	Lichtenthaler	
First Name	Ulrich	
Title	Absorptive capacity, environmental turbulence, and the complementarity of organizational learning processes	
Year	2009	
Co-Authors	Kolk, A.	
Type of Article	Research Paper	
Published by	Academy of Management	
Initiated by	University	
Ref.-ID	4679	
Ref.-type	Journal article	
Journal	Academy of Management Journal	
Volume	52	
Issue	4	
pages	822-846	
Level of examination	Organization	
Country of origin	Germany	
Subject	Management, Business	
Industry sector	Cross-sector	
Country	Germany	
Continent	Europe	
Ranking		
ISI-Factor	6,438	
VHB JQ2	A+	
Handelsblatt	1	
Source	Journal	
Search term	Searched within Journal	
Abstract	Following the process-based definition of absorptive capacity, this article identifies technological and market knowledge as two critical components of prior knowledge in the organizational learning processes of absorptive capacity. Data from a multi-informant survey conducted in 175 industrial firms show that exploratory, transformative, and exploitative learning have complementary effects on innovation and performance. The results emphasize the multidimensional nature of absorptive capacity, and they help to explain interfirm discrepancies in profiting from external knowledge. Moreover, the findings underscore the importance of dynamic capabilities in contexts characterized by high degrees of technological and market turbulence.	
Code	Segment	Page
Type of study	-	
Aim of article	Therefore, this article addresses the following critical question: How do interactions between the learning processes of absorptive capacity influence innovation and performance under different environmental conditions?	1
Research Discipline by author	-	
Adaptive capacity		
Definition	-	
Thesaurus	absorptive capacity is a firm's ability to utilize external knowledge through the sequential processes of exploratory, transformative, and exploitative learning (Lane, Koka, & Pathak, 2006)	1
	Cohen and Levinthal's (1990) basic assumption is that prior related knowledge determines a firm's level of absorptive capacity (Lane et al., 2006; Tsai, 2001).	2
	According to Helfat et al., "A dynamic capability is the capacity of an organization to purposefully create, extend, or modify its resource base" (2007: 4).	2

	Therefore, recent work has developed a process-based view of absorptive capacity in which a firm's stock of prior knowledge constitutes the basis for knowledge flows within the three learning processes (Lane et al., 2006)	2
	By contrast, firms with prior technological and market knowledge may flexibly adapt to environmental changes and avoid core rigidities by maintaining a large knowledge base (Teece et al.)	4
Characteristics	Technological knowledge is the knowledge that a firm actually explores, transforms, and exploits in its absorptive capacity processes (Cohen & Levinthal, 1990; Tsai, 2001). For instance, a firm recognizes a new technology, which could be acquired from an external technology source (Cassiman & Veugelers, 2006; Rothaermel & Deeds, 2004).	2
	Market knowledge, by contrast, refers to applications and commercialization opportunities for technological knowledge (Teece, 2007; van den Bosch, Volberda, & de Boer, 1999).	2
Adaptation	-	
Strategy		
Strategy development	-	
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	-	
Miscellaneous		
Results	In turbulent environments, firms tend to strongly rely on external knowledge (Droge et al., 2008). Thus, the impact of absorptive capacity on innovation and performance grows (Narasimhan et	7
Criticism / Limits	-	
Other important facts	In particular, understanding of environmental influences and of interactions between the learning processes of absorptive capacity is limited (Lane et al., 2006; Tsai, 2001).	1
Further research investigations	-	

Name	Lien	
First Name	Bella Ya-Hui	
Title	Organizational learning as an organization development intervention in six high-technology firms in Taiwan: An exploratory case study.	
Year	2007	
Co-Authors	Hung, Richard Y.; McLean Gary N.	
Type of Article	Research Paper	
Published by	John Wiley & Sons, Inc	
Initiated by	University	
Ref.-ID	4715	
Ref.-type	Journal article	
Journal	Human Resource Development Quarterly	
Volume	18	
Issue	2	
pages	211-228	
Level of examination	Organization	
Country of origin	Taiwan	
Subject	Management, Strategy, Organization	
Industry sector	-	
Country	Taiwan	
Continent	Asia	
Ranking		
ISI-Factor	-	
VHB JQ2	-	
Handelsblatt	-	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND business	
Abstract	Organizational learning (OL) is about how individuals collect, absorb, and transform information into organizational memory and knowledge. This case study explored how six high-technology firms in Taiwan chose OL as an organization development intervention strategy. Issues included how best to implement OL; how individuals, teams, and organizations learn; and the extent to which OL activities contributed to organizational performance. Five themes emerged as findings: (1) using language with which employees are familiar, (2) implementing OL concepts that are congruent with employees' work or personal life, (3) putting individual learning first and diffusing it to team learning and organizational learning, (4) using the knowledge management system to create an opportunity for individuals, teams, and the organization to learn, and (5) linking OL to organizational strategy to improve organizational performance.	
Code	Segment	Page
Aim of article		
Adaptive capacity		
	The OL literature draws a distinction between two complementary research trends (Gond & Herrbach, 2006; Miner & Mezas, 1996): behaviorist approaches view OL as an adaptive capacity of organizations with respect to their environment, while cognitive approaches focus on the evolution of knowledge and view learning as a cognitive shift.	214f.
Definition	Organizational learning (OL) is about how individuals collect, absorb, and transform information into organizational memory and knowledge.	211
Thesaurus	Organizational Learning. OL refers to the capacity of an organization to change and improve continuously. OL helps organizations to move beyond their current situation by solving existing problems and ultimately transforming the organization. It results in the development of a learning organization where empowered members take responsibility for strategic direction.	214
Characteristics	-	

Adaptation	-	
Strategy		
Strategy development	-	
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	-	
Miscellaneous		
	Five themes emerged as findings: (1) using language with which employees are familiar, (2) implementing OL concepts that are congruent with employees' work or personal life, (3) putting individual learning first and diffusing it to team learning and organizational learning, (4) using the knowledge management system to create an opportunity for individuals, teams, and the organization to learn, and (5) linking OL to organizational strategy to improve organizational performance.	211
	based on the study themes, the proposed model for OL processes answers the first research question. The model has three parts: the goals for using OL as an OD intervention, OL strategy and OL techniques to implement OL concepts, and the results of implementing OL	223
Results	From the findings, the goals in implementing OL can be summarized as improving organizational effectiveness, enabling individual active learning, and improving products and service quality through learning and innovation	224
	Strategies for implementing OL included combining performance management and development programs related to OL, setting up a knowledge management system to enable learning, and cultivating a supportive, open, and flexible culture for employees to detect errors and make decisions about improvement	224
	The techniques for implementing OL included forming study groups to encourage people to absorb new knowledge or insights, training study group facilitators with dialogue and empathy skills, and creating communities of practice to help employees share their experiences and improve their innovation capabilities	224
Criticism / Limits	-	
Other important facts	-	
Further research investigations	-	

Name	Linneluecke	
First Name	Martina K.	
Title	Firm relocation as adaptive response to climate change and weather extremes	
Year	2010	
Co-Authors	Stathakis, Alexander; Griffiths, Andrew;	
Type of Article	Research Paper	
Published by	Elsevier Science Publishing Company, Inc.	
Initiated by	University	
Ref.-ID	4659	
Ref.-type	Journal article	
Journal	Global Environmental Change	
Volume	21	
Issue	3	
pages	123-133	
Level of examination	Industry	
Country of origin	Australia	
Subject	Business, Strategy, Environmental	
Industry sector	Electricity, gas & water supply	
Country	Australia	
Continent	Australia	
Ranking		
ISI-Factor	-	
VHB JQ2	-	
Handelsblatt	-	
Source	Google Scholar	
Search term	Searched within reference list	
Abstract	Growing scientific evidence suggests that human-induced climate change will bring about large-scale environmental changes such as sea-level rise and coastal flooding, extreme weather events and agricultural disruptions. The speed and extent of these changes and the expected impacts on social and corresponding economic and industrial systems are now moving to the forefront of debates. In this paper, we argue that climate change will lead to significant disruptions to firms which might ultimately create the necessity of a geographical shift of firm and industrial activities away from regions highly affected by climate change. Such a shift might become necessary due to (1) direct disruptions through climate change impacts on firm operations, for instance through droughts, floods, or sea level rise, and due to (2) disruptions in a firm's supplier, buyer or resource base that lead to flow-on effects and adverse consequences for a firm. We propose a framework for integrating firm relocation decisions into firm adaptive responses to climate change. The framework consists of three assessment steps: the level of risk from climate change impacts at a firm's location, the feasibility of relocation, and associated costs and benefits. We apply the framework to two case examples. The first case of electricity distribution firms in Victoria/Australia illustrates how the relocation of cables could decrease the vulnerability of distribution networks to bushfires and the risk of electricity-caused fires, but would require significant investments. The second case of firms in the Australian pastoral industry points to geographic diversification of pastoral land holdings as possible adaptation option, but also to constraints in form of availability of suitable properties, ties to local communities, and adverse impacts on biodiversity. Implications for adaptation research and practice are outlined.	
Code	Segment	Page
	This paper is specifically concerned with addressing the physical impacts of climate change as they play out at the firm level	123
Aim of article	Firms are constantly adjusting and adapting to economic conditions, but little is known about their adaptability to natural environmental change and climate change in particular	123
	Aiming to redress this gap, this paper develops a conceptual foundation for integrating decisions on firm relocation into firm adaptive responses to climate change	124
Adaptive capacity	researchers have only just begun to investigate the capacity of firms to adapt to climate change impacts (Berkhout et al., 2006; Hoffmann et al., 2009; Linnenluecke and Griffiths, 2010).	124

	<p>firms may face limited capacities to adapt by trying to secure their position in a certain geographic location through the deployment of firm resources and capabilities (Haigh, 2008; Hart, 1995, 1997).</p>	125
	<p>Anticipated changes in climate and weather patterns put great pressure on businesses to strengthen their capacity for anticipatory adaptation (i.e., to undertake longer-term adjustments to observed or expected impacts from climate change) and to explore options to address impacts from both gradual changes and changes in extreme conditions (Linnenluecke and Griffiths, 2010).</p>	125
Definition	-	
Thesaurus	-	
Characteristics	-	
Adaptation	<p>A common objective of firms, particularly in sectors exposed to climate variability such as natural-resource based industries, has been to reduce sensitivity to climate impacts, for example through crop diversification, water management, disaster risk management, and insurance (Adger et al., 2007), but also through a diversification of the firm's portfolio and geographic activities</p>	125
Strategy		
	<p>Furthermore, we argue that firm relocation in the face of climate change impacts will become a strategically important source of decision-making for corporate leaders and will be framed around issues such as likely impacts on infrastructure, supporting services and resource scarcity.</p>	124
	<p>We suggest that research is needed to investigate relocation strategies for firms in order to avoid a situation where a firm is unprepared to deal with impacts and forced to move elsewhere.</p>	124
	<p>Secondly, many of these changes are not on the strategic planning or risk horizons of firms and industries—which traditionally operate in short-term financial reward cycles. In other words, there is a mismatch between changing climate and weather patterns and firm goal setting behaviors.</p>	124
	<p>Business scholars maintain that firms are generally able to respond to environmental changes through strategically utilizing firm-specific resources and capabilities, such as financial resources, human resources, information, technology, or knowledge (Barney, 1991, 1995).</p>	124
Strategy development	<p>covers the expansion of firm activities, in particular across countries. Researchers have investigated how developments in information technology and falling barriers of trade were encouraging companies to internationalize and to seek market opportunities beyond their home market. This literature is primarily focused on the expansion of commercial activities abroad and the discovery of new market opportunities elsewhere (Morgan and Katsikeas, 1997; Prange and Verdier, 2010)</p>	126
	<p>firm relocation and the substitution of one location for another (i.e., a change of address, rather than an expansion or internationalization of firm activities). This literature outlines that there are push and pull factors for relocation decisions; relocation is therefore not only about finding an optimal location for a firm's operation based on the attractiveness of one location (i.e., decisions about where to relocate—pull factors), but also about the decision to move out of the present location (i.e., decisions about whether and why to relocate—push factors) (Arauzo-Carod et al., 2010; Brouwer et al., 2004; Pellenbarg et al., 2002).</p>	126
Climate change strategy	<p>We therefore propose that more radical adaptation measures, such as firm relocation, might offer a strategic alternative to in situ climate change adaptation if carefully considered.</p>	125
	<p>and made the case that firm location and relocation decisions in response to climate change will become key areas of strategic engagement for firm decision-makers.</p>	125
	<p>managers should attempt to understand their firm's vulnerability to climate-related impacts, including both direct impacts in form of shifting temperature and weather patterns, and more indirect impacts in form of the reliability of infrastructures and supply chains (Porter and Reinhardt, 2007)</p>	126f.
Relevance for decision-making	<p>Firms can also strategically prepare by building up internal climate expertise and monitoring ongoing developments in their supply chains, industries and external environments (Pinkse and Kolk, 2009)</p>	127
	<p>Expert knowledge gathered in a 'what-if' scenario analysis can help charting possible complex linkages within and between firm and the environment and improve firm preparedness to climate change and changes in weather extremes.</p>	127
	<p>Consequently, risk assessments will have to be generated for the individual firm, and relocation decisions will have to consider context-dependent factors.</p>	127
	<p>The considerations presented in this section align with factors identified earlier that facilitate or hinder firm relocation decisions: uncertainty surrounding relocation options and climate change impacts, the availability of information, relocation costs and factors in the firm's institutional environment, but also the motivation to seek environmental stability, security and prosperity.</p>	128
Business relevance	<p>Growing scientific evidence (e.g., Parry et al., 2007) suggests that climate change will bring about large-scale environmental changes such as sea-level rise and coastal flooding, extreme weather events and disruptions to agricultural systems (Brown, 2008; Smith, 2007)</p>	123

	Climate change poses novel risks outside the range of firms' previous experience, and firms might not be able to withstand impacts by using traditional practices to cope with climate variability. Furthermore, supply chains, materials access and production, and the pressing issue of access to consumer markets may also increasingly be impacted upon by changing climate conditions	125
Miscellaneous		
Results	To date, the topic of firm relocation due to climate change impacts has only received limited attention in research and business practice; for instance, the IPCC report offers discussions of relocation as potential climate change adaptation strategy and provides examples (e.g., Wilbanks et al., 2007), but does not further address strategic implications for firms and industries.	130
	Climate change related relocation has been given consideration in policy oriented discussions, but not in management decisions	130
	The effects of climate change and extreme weather events have been considered as peripheral or as a risk factor, but not as a determining factor in firm relocation processes	131
	We argue that without suitable adaptive capabilities – and in particular appropriate decision-making knowledge – many firms could find themselves unprepared when encountering impacts of human-induced climate change.	131
	Further to the theoretical contribution, this research has practical implications for decision-makers and managers in developing suitable adaptation and resilience strategies in order to be prepared for climate change impacts and a possible increase in the frequency and/or intensity of extreme weather events. Relocation strategies have already been investigated in some regions likely to be affected by climate change, not only on a firm level, but also on a broader socio-economic level.	131
Criticism / Limits	-	
Other important facts	Environmental stability as well as 'fit' between firm and environment has traditionally been regarded as desirable – if not necessary – states for business activity (Meyer et al., 2005).	124
	The focus has largely remained on economic conditions and how firms can achieve a sustainable (i.e., financial) competitive advantage	124
Further research investigations	-	

		37
Name	Linneluecke	
First Name	Martina K.	
Title	Beyond Adaptation: Resilience for Business in Light of Climate Change and Weather Extremes	
Year	2010	
Co-Authors	Griffiths, Andrew	
Type of Article	Theoretical Paper	
Published by	Sage Publications, Ltd.	
Initiated by	Research Institute	
Ref.-ID	4661	
Ref.-type	Journal article	
Journal	Business & Society	
Volume	49	
Issue	3	
pages	477-511	
Level of examination	Organization	
Country of origin	n. A.	
Subject	Business, Society, Environmental	
Industry sector	-	
Country	-	
Continent	-	
Ranking		
ISI-Factor	-	
VHB JQ2	B	
Handelsblatt	0.3	
Source	ISI Web of Science	
Search term	adaptive AND skill* OR competenc*OR capab* OR resource* OR abilit* AND "climat* change" OR global change OR environment* change OR "global warming" OR "extreme weather events" AND compan* OR business OR enterprise* OR organi?ation* OR management OR firm* OR corporat* OR sector OR industry AND strategy NOT "adaptive capacity	
Abstract	<p>Scientific findings forecast that one of the major consequences of human-induced climate change and global warming is a greater occurrence of extreme weather events with potentially catastrophic effects for organizations, industries, and society. Current management and adaptation approaches typically focus on economic factors of competition, such as technology and innovation. Although offering useful insights, these approaches are potentially ill equipped to deal with any increases in drastic changes in the natural environment. This article argues that discussions on organizational adaptation need to be broadened and that new conceptual and practical approaches are needed to incorporate the effects of climate change and a greater occurrence of weather extremes into corporate strategy and decision making. The authors advance the notion that a resilience framework might provide insights into dealing with new types of environmental change. They contend that by developing resilience, organizations can develop resources and capabilities to avoid or minimize organizational collapse and to reorganize in light of discontinuities associated with climate change and weather extremes. Implications for organizational practice and research are discussed.</p>	
Code	Segment	Page
Aim of article	This article argues that discussions on organizational adaptation need to be broadened and that new conceptual and practical approaches are needed to incorporate the effects of climate change and a greater occurrence of weather extremes into corporate strategy and decision making	477
Adaptive capacity		
Definition	-	
Thesaurus	resilience, that is, their capacity to absorb the impact and recover from drastic environmental change associated with weather extremes (Linnenluecke, Griffiths, & Winn, 2008).	479
	These differences in response mechanisms suggest that some organizations have different underlying qualities or capabilities that allow them to better deal with adversity than other organizations under similar circumstances.	484

	Thus, resilience is generally referring to the capability of a system to recover after undergoing significant disturbance.	487
	In this context, organizational resilience has been defined as organizational ability to undertake positive adjustments under challenging conditions, including adjustments to both ongoing strains due to small interruptions as well as severe disruptions from larger events (Sutcliffe & Vogus, 2003). The main aspects of organizational resilience in this context are the continuing capacity to recover from disturbances as well as the capacity to rebound from adversity in a strengthened and more resourceful way	488
Characteristics	Although adaptation is a process of deliberate change in anticipation of or in reaction to certain environmental stimuli, the concept of resilience is more systems focused and takes a more dynamic view (Nelson et al., 2007).	487
Adaptation	Although current debates on climate change policy and corporate response are focused on adaptation, that is, longer term adjustments that organizations can take in response to actual or predicted environmental change (Nelson, Adger, & Brown, 2007), we advance the notion that a resilience framework may provide insights into dealing with new types of environmental change	479
	Traditionally, the question of how organizations can cope with actual or predicted environmental change has been of central concern to the organizational adaptation literature	484
Strategy		
	We suggested in this article that organizations undergo and occupy different stages in an adaptive cycle. Correspondingly, we argue that they require different sets of capabilities in each of the different stages.	497
	However, organizations often tend to focus on short-term economic goals (Starik & Rands, 1995), rather than preparing for low-probability but high-consequence extreme events and longer-term changes in the natural environment (Hoegh-Guldberg et al., 2007)	497f.
Strategy development	we argue that organizations require several sets of different capabilities that enable them to prepare for more frequent and/or severe weather extremes. At a strategic level, organizations would require capabilities around future search (i.e., around the identification of vulnerabilities and ongoing changes in climate and weather patterns) and, ideally, capabilities that would allow an improved understanding of how the natural environment interacts (and interferes) with organizational activities. Furthermore, organizations would require strategic capabilities that would enable them to identify climate change or extreme weather event hot spots and have in place long-term plans to avoid or reduce threats, for instance, by relocating away from risk-prone locations or by diversifying production activities (Wilbanks et al., 2007).	498
	The crisis management literature (e.g., Mitroff & Pearson, 1993) identifies a range of first-order, short-term crisis response capabilities. However, although these capabilities are appropriate for an initial response, they may not provide much in the way of building longer term resilience.	498
	from crisis response to developing larger scale infrastructure improvements (e.g., putting lines underground rather than on poles so that the organization is not increasingly responding to crisis events; Linnenluecke et al., 2008). This would require a shift in both strategic and operational response strategies	499
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	Scientific findings forecast that one of the major consequences of human-induced climate change and global warming is a greater occurrence of extreme weather events with potentially catastrophic effects for organizations, industries, and society	477
	The authors advance the notion that a resilience framework might provide insights into dealing with new types of environmental change	477
	A significant challenge for organizational decision makers and managers has always been to deal with unexpected changes in their organizations' environments (King, 1995; Weick & Sutcliffe, 2001).	478
	Few environmental changes, however, exhibit as much uncertainty and potential for disastrous consequences as those associated with climate change and extreme weather events in particular (Barnett, 2001).	478
	The Intergovernmental Panel on Climate Change (IPCC) defines climate change as "a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer" (Baede, 2007, p. 943).	478
	We propose that the likely increase in frequency and/or severity of these types of events requires the development of new organizational capabilities and slack resources to deal with the unpredictable, nonlinear, and nonincremental change associated with them (Trenberth et al., 2007).	479
	Moreover, in addition to uncertainty about what is reasonably expected to occur, there are unforeseen events (surprises) that pose the largest amount of uncertainty for organizational decision makers and management in formulating organizational responses (Barnett, 2001; Linnenluecke et al., 2008)	499
Miscellaneous		

Results	As organizations (as well as socioecological systems in general) can be regarded as complex networks consisting of various actors and information flows between them, a network perspective might provide new insights into understanding resilience (Webb & Bodin, 2008).	501
Criticism / Limits	-	
	However, as extreme weather events increase over time, crisis management and response are likely to become more costly and may stretch existing capabilities.	499
Other important facts	Researchers have pointed to the importance of organizational resources (in particular slack resources) in enabling organizations to respond to environmental disruptions, thus allowing the organization to adjust to its changing environment (e.g., Meyer, 1982), and to minimize or avoid impacts from greater climate variability and weather extremes (Griffiths & Winn, 2005; Linnenluecke et al., 2008). Slack resources can include backup facilities for organizational data and critical systems, access to resource inputs through various suppliers and locations (rather than reliance on a single supplier and/or location), and financial slack resources.	500
	We further argue that the often-cited fit of an organization with its business environment, along with a growing degree of specialization and niche orientation, again works particularly well under relatively stable conditions.	500
	Additional research will be required to understand trade-offs between processes of building resilience (by assembling resources and capabilities that may not be required immediately) versus the desire for organizations to be lean, efficient, and remove excessive forms of slack	501
	We proposed that current debates on organizational adaptation need to be broadened to incorporate discontinuities associated with climate change and weather extremes as well as discussions on how organizations can formulate	502
Further research investigations	Organizations will not only have to strengthen their adaptation to gradual impacts of climate change but also their resilience, that is, their capacity to absorb the impact and to recover from increased climate variability. A broadened perspective on adaptation might help organizations to understand which adjustments or actions can ultimately enhance resilience or reduce vulnerability to expected changes in climate and weather patterns.	503
	We suggested that insights are required into the resources, capabilities, and response strategies that organizations may need to survive under turbulent climatic conditions. To build resilience, organizations may need to develop multiple capabilities and response approaches.	503

Name	Lisø
First Name	Kim Robert
Title	A norwegian perspective on buildings and climate change
Year	2007
Co-Authors	Myhre, Lars; Kvande, Tore; Thue, Jan Vincent; Nordvik, Viggo
Type of Article	Research Paper
Published by	Routledge
Initiated by	University, Research Institute
Ref.-ID	4676
Ref.-type	Journal article
Journal	Building Research & Information
Volume	35
Issue	4
pages	437-449
Level of examination	Industry
Country of origin	Norway
Subject	Construction & Building Technology
Industry sector	-
Country	Norway
Continent	Europe
Ranking	
ISI-Factor	1.259
VHB JQ2	-

Handelsblatt	-	
Source	BSC	
Search term	"adaptive capacity" AND climat* change AND strategy AND compan*	
Abstract	<p>The current Norwegian climate research structures, policies and priorities, mitigation and adaptation options are discussed as well as the development of local climate change projections and adaptation measures. A major difficulty is that Norway's present energy supply has a low carbon intensity because a substantial part derives from hydropower, but increasing demand may be met by gas-fired electricity generation, thereby making efficiency and conservation a much higher priority. A National Action Plan on Climate Research recognizes the need for increased research efforts in several areas, incl. the impacts on the built environment and the more general impacts on society. Mitigation oport. for reducing GHG emissions within the built environment include increased technological efficiencies, reduced energy usage through improved design, mandatory labelling schemes and a switch to climate neutral fuels for heating. However, radically lower energy requirements and lower U-values will be problematic, requiring new technical solutions and construction methods. There is little integration of policy and strategy for adaptation in Norway. The recognition that climate change will further enhance an array of different, harsh microclimates in Norway, which vary according to individual locality, has led to the development of new adaptation approaches and methods. These allow for the projected local climate to inform decisions on an appropriate design response to meet performance-based codes. The development of design guidance for high-performance building envelopes will, in future, take account of projected local climate. However, there is a tension between the need for standardized national building solutions and the need to adapt to local climatic conditions.</p>	
Code	Segment	Page
Aim of article	-	
Adaptive capacity		
	But total success is clearly dependent on the adaptive capacity and determination of all actors involved in the construction industry.	445
Definition		
Thesaurus	-	
Characteristics	-	
Adaptation	A successful implementation of adaptation policies at the national level is dependent on a few key institutions' ability to initiate both government regulatory measures and local-level collective efforts to reduce climate vulnerability. The insurance market in Norway is regulated by a risk-pooling mechanism covering natural perils (Lisø et al., 2003)	448
Strategy		
Strategy development	-	
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	-	
Miscellaneous		
	So far, the integration of strategies and policies for climate change adaptation in Norway has not yet taken place to any great extent. The impacts of climate change could be considerable, and felt by a wide range of sectors and industries	448
Results	Market trends towards larger actors and standardized building solutions can undermine adaptation to local climatic conditions. Building regulations and standards shape the institutional organization of the sector, having considerable influence on adaptation to climate change	448
	Finally, lessons learned from living and building in an extremely varied climate must be considered a competitive advantage for the Norwegian construction industry that by far has been fully employed to good purpose.	448
Criticism / Limits	-	
Other important facts	-	
Further research investigations	To ensure necessary knowledge and awareness to cope with the future risks of climate change, and also Norwegian climate research of high international standard, it is necessary to increase the research efforts considerably.	448

		39
Name	Lisø	
First Name	Kim Robert	
Title	Integrated approach to risk management of future climate change impacts	
Year	2006	
Co-Authors	-	
Type of Article	Theoretical Paper	
Published by	Routledge	
Initiated by	University, Research Institute	
Ref.-ID	4630	
Ref.-type	Journal article	
Journal	Building Research & Information	
Volume	34	
Issue	1	
pages	1-10	
Level of examination	Industry	
Country of origin	Norway	
Subject	Construction & Building Technology	
Industry sector	-	
Country	Norway	
Continent	Europe	
Ranking		
ISI-Factor	1.259	
VHB JQ2	-	
Handelsblatt	-	
Source	BSC	
Search term	"adaptive capacity" AND climat* change AND strategy AND organi?ation*	
Abstract	<p>The vulnerability of the built environment will be influenced by global-scale climate change. However, there are large uncertainties associated with the future performance of buildings due to changes in regional- and local-scale climatic impact. The use of modern risk-management theories is discussed for developing cross-disciplinary strategies to meet the challenges of future climate change. It is shown that there are benefits to be gained from the introduction of risk-management strategies within a greater extent of the construction industry. Cross-disciplinary risk-based management strategies (ensuring cooperation along vertical decision-making lines), together with design guidelines that account for both historical local climatic conditions and scenarios for future changes, can be an important step towards a more active and dynamic way of ensuring a high-quality construction process and a sustainable built environment. Reducing the potential for defects or damage through the development of technical and organizational preventive measures (a risk-based management strategy) while at the same time applying the precautionary principle and discursive strategies in the design, construction and geographical localization of buildings, is likely to increase the robustness of the built environment in the light of the unknown risks of future climate change.</p>	
Code	Segment	Page
Aim of article	The present paper discusses the use of modern riskmanagement theories as a basis for the development of cross-disciplinary strategies to meet the challenges of future climate change within the built environment.	2
Adaptive capacity		
	Norway's vulnerability is likely to be influenced by impacts from global-scale climate change, even though the country is considered to have a high adaptive capacity based on macro-level indicators such as wealth, technology, information, skills, infrastructure, institutions, equity, empowerment and the ability to spread risk (McCarthy et al., 2001; Yohe and Tol, 2002; O'Brien et al., 2004).	2
Definition	'Adaptive capacity' is the ability of a system to adjust to climate change, including climate variability and extremes, to moderate potential damages, to take advantage of opportunities, or to cope with the consequences.	3
Thesaurus	Institutional capacity To cope with actual and potential changes in climate and climate variability, it is necessary that affected institutions have the organizational and technological capacity and human resources	4

	needed to combat these challenges.	
Characteristics	-	
Adaptation	-	
Strategy		
	However, as new knowledge leads to a greater understanding of global-, regional- and local-level climate change and associated effects, and thus reduces uncertainty, other risk-management strategies could be advantageous. When the main criteria of risk classification, probability of occurrence and extent of damage, are relatively well known, a risk-based management strategy could also be applied. Reducing the potential for damage through the development of technical and organizational preventive measures (a riskbased management strategy), while at the same time applying the precautionary principle in the design, construction and geographical localization of buildings, is likely to increase the robustness of the built environment	5
	A lack of awareness of climate change impacts calls for a third management strategy to be introduced: the discursive strategy. This strategy is both appropriate and necessary where the potential for wide-ranging damage is ignored due to a delay effect as, for example, the impacts of future climate change, i.e. the risk is not being taken seriously because of the delay between the initial event and the damage impact (Klinke and Renn, 2001).	6
	Precaution in this context means the development of policies on mitigation, adaptation, monitoring and continuous research, even if there is no clear evidence of future harmful impact.	5
Strategy development	In order to develop adaptation strategies, effective ways must be found to strengthen institutional capacity. Cross-disciplinary risk-based management strategies, together with design guidelines that account for both historical local climatic conditions and potential future changes, can be an important step towards a more active and dynamic way of ensuring a high-quality construction process and a sustainable built environment in the light of the unknown risks of future climate change.	8
	risk-based, precautionary and discursive. The choice of strategy is strongly dependent on the characteristics of the risk at hand.	9
	Precautionary strategy The risk class Pythia demands the application of a precautionary risk-management strategy, as uncertainty is attached to both frequency and consequences.	5
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	Projected changes in climatic conditions will further enhance vulnerability within the construction industry and the built environment.	3
Miscellaneous		
Results	Cross-disciplinary risk-based management strategies (ensuring cooperation along vertical decision-making lines), together with design guidelines that account for both historical local climatic conditions and scenarios for future changes, can be an important step towards a more active and dynamic way of ensuring a high-quality construction process and a sustainable built environment.	1
	Reducing the potential for defects or damage through the development of technical and organizational preventive measures (a risk-based management strategy) while at the same time applying the precautionary principle and discursive strategies in the design, construction and geographical localization of buildings, is likely to increase the robustness of the built environment in the light of the unknown risks of future climate change.	1
Criticism / Limits	-	
Other important facts	Spence (2004) examines national policies of risk mitigation and states that improved government action and regulation can contribute to the reduction of impacts from natural disasters	4
Further research investigations	-	

		40
Name	McCann	
First Name	Joseph	
Title	Building agility, resilience and performance in turbulent environments	
Year	2009	
Co-Authors	Selsky, John; Lee, James	
Type of Article	Research Paper	
Published by	HR People & Strategy	
Initiated by	University	
Ref.-ID	4689	
Ref.-type	Journal article	
Journal	People & Strategy	
Volume	32	
Issue	3	
pages	44-51	
Level of examination	Organizations	
Country of origin	USA	
Subject	Business, HRM	
Industry sector	Cross-sector	
Country	Canada, USA	
Continent	North America	
Ranking		
ISI-Factor	-	
VHB JQ2	-	
Handelsblatt	-	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND business	
Abstract	The article discusses how organizations can become more agile, create resiliency, and improve their performance when they are challenged by intense competition or disruptive change. The discussion focuses on the authors' multi-industry survey on the effect of environmental turbulence on 471 North American companies. Change management practices, adaptive capacity, the pace of change, organizational performance measures, agility and resiliency measures, employee development, and the the profitability path model are discussed. Interventions for building agility and resiliency are mentioned.	
Code	Segment	Page
Aim of article	-	
Adaptive capacity		
	Turbulence is experienced unevenly because the capacity for adapting to turbulence varies significantly from individual to individual, group to group, organization to organization and industry to industry (McCann & Selsky, 1984).	46
	Adaptive capacity has at least two important dimensions: agility and resiliency.	46
	Conversely, it is likely that high levels of adaptive capacity, supported by high performance, can better moderate turbulence; organizations better manage turbulence	49
	They must: 1) balance attention to agility and resiliency; 2) build both of these at multiple levels; and 3) think strategically in assessing and aligning interventions to build the	49
	Building adaptive capacity requires strategic leadership and commitment.	51
Definition	the amount and variety of resources and skills possessed and available for maintaining viability and growth relative to the requirements posed by the environment.	45

	Resiliency	The capacity for resisting, absorbing and responding, even reinventing if required, in response to fast and/or disruptive change that cannot be avoided.	45
	Agility	The capacity for moving quickly, flexibly and decisively in anticipating, initiating and taking advantage of opportunities and avoiding any negative consequences of change.	45
Thesaurus			
		Change-management practices designed to promote agility have concentrated on creating an openness to change and assuring swift execution of strategy by destroying structural or cultural barriers that impede the flow of work, people, resources and ideas (Dyer & Singh, 1998; Goldman et al., 1994).	46
		Resiliency is a newer concept, rooted in psychotherapy and social psychology (Hind, Frost & C Rowley, 1996; Ruttner, 1990), material science (Sheffi, 2005) and ecology (Helling & Gunderson, 2002). and it is fundamentally about the "robustness" of systems (Beinhocker, 1999; Deevy, 1995).	46
Characteristics	-		
Adaptation	-		
Strategy			
Strategy development	Building adaptive capacity becomes a strategic Imperative as the pace and disruptiveness of change accelerates.		51
Climate change strategy	-		
Relevance for decision-making	-		
	Organizations must build agility and resiliency to perform effectively in turbulent environment		45
Business relevance	Pursuing agility without investing in resiliency is risky because it creates fragility— unsupported exposure to surprises and shocks.		45
Miscellaneous			
	Companies exhibiting higher levels of agility and resiliency are more competitive and profitable, even with higher levels of turbulence		45
	Specifically, we call for: 1. developing agility and resiliency together; 2. developing agility and resiliency at multiple levels (individual, team, organization and industry); and		45
	The results illustrated in Exhibit 4 demonstrate that agility and resiliency have significant positive correlations with both performance measures. Turbulence, conversely, has a significant negative relationship with competitiveness, a relationship conceptually supported by the idea that turbulence undermines an organization's capacity to respond quickly and recover effectively from setbacks.		48
Results	It also is challenging to build adaptive capacity at an industry level, but managing turbulence at an industry level can help reduce the level of change experienced at the organization level.		50
	Nonetheless, broad-based alliances and consortia for acting on widely shared challenges, such as alleviating global warming, collaboratively strengthening global supply chains., speeding shared decision-making through open access information networks and setting industry standards are all ways of building adaptive capacity beyond a single organization		50
	Those construct items from Exhibit 3 can sound deceptively simple in their capacity-building implications. Yet those of us who have worked with organizations on major change initiatives know they are not simple.		50
	At an organization level, creating a well designed knowledge management system that improves knowledge sharing and retention can speed both decision making and response time. Some of these initiatives are low cost, while others, such as deploying a robust knowledge management system, could take millions of dollars.		51
Criticism / Limits	-		
Other important facts	The inability to keep pace with new product introductions, for example, can ultimately lead to failure for companies in technology-intensive/driven industries. Firms like Nokia in cell phones and Dell in PCs no longer dominate their industries		46
Further research investigations	The literatures on agility and resiliency offer limited guidance. These concepts are not yet well developed		45

		41
Name	Mills	
First Name	Evan	
Title	Climate change, insurance and the buildings sector: technological synergisms between adaptation and mitigation.	
Year	2003	
Co-Authors	-	
Type of Article	Research Paper	
Published by	Routledge	
Initiated by	University	
Ref.-ID	4622	
Ref.-type	Journal article	
Journal	Building Research & Information	
Volume	31	
Issue	3	
pages	257-277	
Level of examination	Organizations	
Country of origin	California	
Subject	Energy Technologies	
Industry sector	Financial intermediation, Construction	
Country	-	
Continent	-	
Ranking		
ISI-Factor	1.259	
VHB JQ2	-	
Handelsblatt	-	
Source	BSC	
Search term	"adaptive capacity" AND climat* change AND strategy AND compan*	
Abstract	Examining the intersection of risk analysis and sustainable energy strategies reveals numerous examples of energy-efficient and renewable energy technologies that offer insurance loss-prevention benefits. The growing threat of climate change provides an added motivation for the risk community to understand better this area of opportunity. While analyses of climate change mitigation typically focus on the emissions-reduction characteristics of sustainable energy technologies, less often recognised are a host of synergistic ways in which these technologies also offer adaptation benefits, e.g. making buildings more resilient to natural disasters. While there is already some relevant activity, there remain various barriers to expanding these efforts significantly. Achieving successful integration of sustainable energy considerations with risk-management objectives requires a more proactive orientation, and coordination among diverse actors and industry groups.	
Code	Segment	Page
Aim of article	This paper describes the significance of global climate change for the insurance industry and the particular	257
	dual role that energy-efficient and renewable energy technologies can play in mitigating greenhouse gas emissions while increasing adaptive capacity by making buildings more disaster resilient	257
Adaptive capacity		
Definition	-	
Thesaurus	Extreme weather-related events have impacted almost all types of insurance providers. The degree of vulnerability to climate change depends on the degree of climate change and by the type of insurance in question (Table 1). Low levels of climate change are expected to have mixed positive and negative impacts, with a strong trend towards net negative impacts as the degree of climate change increases (Figure 3)	258
Characteristics	-	
Adaptation	-	
Strategy		

	Achieving successful integration of sustainable energy considerations with risk-management objectives requires a more proactive orientation, and coordination among diverse actors and industry groups	257
Strategy development	-	
Climate change strategy	-	
	Economic and technical responses	263
	by invoking traditional financial risk-management techniques, such as non-renewal of existing policies, withdrawing from high-risk markets, increasing premiums or deductibles, and limiting	263
Relevance for decision-making	More technically focused risk-management efforts include use of geographic information systems to better understand and pinpoint risks, land-use planning, flood control programmes, mitigation along coastlines, cloud seeding to divert hail storms, tightened zoning, improved weather forecasting and storm warning systems, and public spending on disaster preparedness and recovery	264
	Some insurers have taken a more long-term approach, focusing on the roots of climate change rather than simply preparing for it. This includes participating in climate research either by employing climatologists or by hiring outside experts	264
	A number of forward-looking insurers have explored possible involvements with energy-efficient and renewable energy technologies	264
Business relevance	-	
Miscellaneous		
Results	-	
Criticism / Limits	-	
	Natural disasters and relatively small events resulting from weather extremes have well-known consequences for the insurance and risk-management industries. These losses are on the rise (Figure 1	257
	The buildings sector is perhaps the most vulnerable, with exposures ranging from damage to physical infrastructure to disruption of business operations to adverse health and safety consequences for building occupants (Camilleri et al., 2001; Lowe, 2001a; Scott et al., 2001; Vellinga et al., 2001)	258
	The growing use of catastrophe ('CAT') models is a step in the right direction, although these models are hamstrung by virtue of being predicated largely on historical data rather than scenarios incorporating future climate change. CAT models help insurers conduct scenarios of property damage for different types of events and localities, but often fail to capture smaller scale b	259
Other important facts	Insurers rely upon their ability to predict the economic consequences of future events. ... In a period of changing climate, when the very basis of their decisions may be changing, then they need to have a better understanding of climate change. ... The fact that future events may not be a linear progression of the past, but in fact may have changed as a result of natural variability, or human activity or whatever, is an important thing to be taken into consideration. (Franklin Nutter, Business Insurance, 1998)	261
	It is generally agreed that the current upward trend in losses is a product of both human and climatological factors, but an in-depth understanding is hampered by technical complexity and insufficient data (Vellinga et al., 2001)	261
	One important yet often overlooked class of small events are those involving damage to buildings and pipelines due to soil subsidence (contraction/expansion of soil as a function of moisture content), lightning, ordinary hail- and windstorms, and coastal erosion	262
	Realistic future scenarios involve multiple, coincident events, e.g. consecutive (or overlapping) natural disasters, taking place during a time of weakness in the financial markets and/or non-weather related losses. This was witnessed before in the USA with the Great Depression and the Dust Bowl.	262
	Climate change is real. Proving that earth's climate is changed by human actions, namely global warming, is like statistically 'proving' the pavement exists after you have jumped out a 30 story building. After each floor your analysis would say 'so far – so good' and then, at the pavement, all uncertainty is removed. (Richard Jones, Hartford Steam Boiler Insurance & Inspection Co., 2000)	265
Further research investigations	-	

		42
Name	Mohrman	
First Name	Susan Albers	
Title	Dealing with rough times: a capabilities development approach to surviving and thriving	
Year	2009	
Co-Authors	Worley, Christopher G.	
Type of Article	Research Paper	
Published by	Wiley Subscription Services, Inc., A Wiley Company	
Initiated by	University	
Ref.-ID	4664	
Ref.-type	Journal article	
Journal	Human Resource Management	
Volume	48	
Issue	3	
pages	433-445	
Level of examination	Organizations	
Country of origin	USA	
Subject	Management, HR, Organizational Studies	
Industry sector	Real Estate, Renting and business activities	
Country	-	
Continent	-	
Ranking		
ISI-Factor	0.930	
VHB JQ2	B	
Handelsblatt	0.5	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND business	
Abstract	Abstract 10.1002/hrm.20292.abs Leaders during a deep and prolonged downturn should introduce organizational practices that build capability in the organization, not only to withstand the uncertainties of rough times better, but also to emerge stronger for the future. We present a set of organization design changes that can create closer connections to the marketplace and better use knowledge in the organization to introduce new ways to deliver value while consuming fewer resources. During rapid change and extreme threats, steering the ship is not sufficient. Leaders must introduce approaches that tap employees' energies throughout the organization.	
Code	Segment	Page
Type of study	-	
Aim of article	-	
Research Discipline by author	-	
Adaptive capacity		
Definition	-	
Thesaurus	On the other hand, forward-looking companies are also seeing opportunities in the crisis to build increased organizational capabilities to adjust dynamically to a quickly changing environment— capabilities that will stand them in good stead now and into the future (Teece & Pisano, 1994).	434
	Organizing for capability not only helps address the uncertainty and pressures, but also builds a foundation for emerging strong and renewed when the upturn occurs	434
	Many studies and case examples demonstrate that an organization's design features determine its ability to address environmental challenges flexibly and put in place the capabilities to carry out its strategy (Lawler & Worley, 2006; Mohrman, 2007a, 2007b)	434

	A company requires a dynamic capability development system (see Figure 1), to make the adjustments in the organization as it confronts uncertainty and the relentless flow of challenges in a prolonged downturn. Three principles should guide the design approaches to achieve this:	435
	This instead depends on the contributions and initiative of people throughout the organization	435
Characteristics	Innovation Capability Stormy business conditions may demand battening down the hatches, but they also cry out for innovation	437
	Quick Implementation Capability Most organizations are littered with innovative ideas that were partially resourced but never fully implemented—and this is an unacceptable pattern during a downturn	437
	Organization structures	438
	Lateral Capabilities	439
	Well-designed lateral capabilities can connect knowledge, build synergy, and reduce coordination costs. This is one of the most overlooked areas of organization design—even in good times	439
	This encourages and enables individuals, teams, and BUs to generate and implement new and improved ways to carry out their work. Executive leaders must rely on the many individuals and BUs throughout the organization to figure out how to accomplish the high-level strategies they formulate. The capacity, capability, and authority to pursue the organization's mission and objectives must be broadly held throughout the organization	444
Adaptation	-	
Strategy		
Strategy development	Many have invested heavily in such initiatives as Six Sigma, knowledge management, and innovation programs to renew and improve their capabilities continually. Companies have often treated these initiatives as add-ons to the organization's core value-delivery system, however, and they are often assigned to specialized staff groups	434
Climate change strategy	-	
Relevance for decision-making	The organization should increase the number of strategic decision-making cycles it goes through, greatly increase its strategic intelligence capability, and look for short-term, momentary competitive advantages to generate revenue. On the basis of agility models of strategy, senior executives should meet weekly or even more frequently to detect and monitor changes and ensure the company is taking appropriate action	436
Business relevance	-	
Miscellaneous		
Results	-	
Criticism / Limits	-	
Other important facts	Leaders during a deep and prolonged downturn should introduce organizational practices that build capability in the organization, not only to withstand the uncertainties of rough times better, but also to emerge stronger for the future	433
	Although the dominoes are still falling and sending waves of change through the economy, forward-looking companies are making two types of changes.	433
	These initiatives are often the first to go when times get rough because they generally are not seen as offering immediate value to the firm's core work.	434
	Leaders must (1) rapidly put in place design elements that foster behaviors to bring costs into alignment with the new business realities, (2) rapidly adjust to customer requirements, (3) engage the organization in identifying and capturing new opportunities, (4) flexibly leverage knowledge and resources across the organization to achieve more with shrinking resources, and (5) innovate	436
Further research investigations	-	

		43
Name	Newey	
First Name	Lance R.	
Title	The evolving firm: how dynamic and operating capabilities interact to enable entrepreneurship	
Year	2009	
Co-Authors	Zahra, Shaker A.	
Type of Article	Research Paper	
Published by	Wiley-Blackwell	
Initiated by	University (University of Queensland, Business School)	
Ref.-ID	4639	
Ref.-type	Journal article	
Journal	British Journal of Management	
Volume	20	
Issue	-	
pages	81-S100	
Level of examination	Organizations	
Country of origin	Australia	
Subject	Management, Business	
Industry sector	Manufacturing	
Country	Australia	
Continent	Australia	
Ranking		
ISI-Factor	0.774	
VHB JQ2	B	
Handelsblatt	0.5	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND business	
Abstract	<p>In this study, we expand our understanding of firm evolution by focusing on how operating and dynamic capabilities interact through endogenously led changes. The focus on endogenous change complements the current emphasis in the literature on how dynamic capabilities help firms cope with the risk of core rigidities following an exogenous shock. Our comparison of two collaborating firms shows that, at the operating capability level, firms build absorptive capacity in value networks during their product development experiences and this learning needs to be captured at the product portfolio planning level. When this learning is captured and transformed, product portfolio planning acts as a dynamic capability reconfiguring operating capabilities based on beliefs about follow-on entrepreneurial opportunities. Under conditions of endogenous change, dynamic capabilities are guided by a proactive entrepreneurial logic, complementing the need for reactive adaptive responses in circumstances of exogenous change. A key implication is that dynamic capabilities have a more expansive and critical role in the adaptation of firms than previously considered. Our theorizing shows how interactions between dynamic and operating capabilities build the adaptive capacity of the organization.</p>	
Code	Segment	page
	In this study, we expand our understanding of firm evolution by focusing on how operating and dynamic capabilities interact through endogenously led changes.	81
	Our fieldwork allows us to more precisely observe the mechanisms that capture learning at the operating and dynamic capability levels to facilitate the routinization of adaptation	82
Aim of article	Our paper makes a number of contributions to the literature. First, we advance new theory regarding the role of dynamic capabilities in firm evolution.	82
	Our discussion raises some questions. How does the building of absorptive capacity at the operating capability level affect the building of this capacity at the dynamic capability level? What are the implications for firm evolution?	85
	Finally, we identify value network absorptive capacity as a key knowledge-based ability of the firm underpinning the interactive learning that occurs between dynamic and operating capabilities	82

	In the second phase of the research, we focused on the interaction between operating and dynamic capabilities in enabling a firm's evolution. Therefore, we collected data on what both Biologic and Pharmalab learned from the Flustop research, development and commercialization effort, the organizational processes that captured this learning and how the learning affected their subsequent product development choices	88
Adaptive capacity		
	Under conditions of endogenous change, dynamic capabilities are guided by a proactive entrepreneurial logic, complementing the need for reactive adaptive responses in circumstances of exogenous change.	81
	We perceive that interactions between dynamic and operating capabilities also routinely occur through the firm's endogenously driven entrepreneurship, often without an exogenous trigger, and it is through this mechanism that firms also build their adaptive capacity	82
Definition	no direct definition --> authors call it adaptive capability (possible definition of adaptive ability: see Thesaurus 1781-2077); the authors see operating and dynamic capabilities as important for developing and evolving in case of change (--> see also definition under Thesaurus start 1107 end 1287 and start 1888- end 2039; see Characteristics of adaptive ability)	83ff
	The degree of reconfiguration necessary can vary depending on the rate of technological change, attributes of capabilities and path dependencies, which result in capability changes ranging from complete substitution to moderate transformation to more minor incremental evolution (Lavie, 2006).	83
	viewing product development and portfolio planning as operating and dynamic capabilities respectively. We then extend the analysis to propose absorptive capacity as a key knowledge-based mechanism linking learning at both levels	83
	firm evolution is underpinned by interactions between dynamic and operating capabilities (Helfat et al., 2007; Winter, 2003; Zollo and Winter, 2002).	81
Thesaurus	Dynamic capabilities counter this effect and are defined as the ability of the firm to reconfigure operating capabilities and thus allow the organization to adapt and evolve (Helfat et al., 2007; Teece, 2007; Zahra, Sapienza and Davidsson, 2006; Zollo and Winter, 2002)	81
	Evolutionary fitness concerns 'how well a dynamic capability enables an organization to make a living by creating, extending, or modifying its resource base' (Helfat et al., 2007, p. 7).	82
	Capabilities involve the coordination of multiple organizational activities and actors all aimed at a specific objective, such as adaptation and growth (Helfat and Peteraf, 2003)	83
	We see absorptive capacity as a key knowledge-based capability underpinning the functioning of both operating and dynamic capabilities	85
	In essence, what we are asserting is that firms need to be able to 'recognize the value of new information, assimilate it and apply it to commercial ends' at both product development and portfolio planning levels (Cohen and Levinthal, 1990, p. 128) = absorptive capacity	84
	Based on their review Zahra and George (2002) view absorptive capacity as being mobilized through four routines of knowledge acquisition, assimilation, transformation and exploitation	84
Characteristics	A well-functioning adaptive capability (Fig. 1 p.84), therefore, requires organizational mechanisms for (1) learning at the product development level (operating capability level), (2) capturing this learning at the portfolio level (dynamic capability level), and (3) reconfiguration of operating capabilities. (Comment: DCs precede operating capabilities, p. 83 bottom)	84
	A key implication is that dynamic capabilities have a more expansive and critical role in the adaptation of firms than previously considered.	81
Adaptation	organizational learning is a key driver of firm adaptation through endogenous entrepreneurship	82
	To remain successful, firms need to adapt and evolve. The notion of capabilities suggests that some firms may be better at this adaptation than others (Helfat et al., 2007).	83
	Capabilities in adaptation, therefore, critically reside within how well the organization successfully coordinates interactions between dynamic and operating capabilities.	83
Strategy		
Strategy development	From the perspective of the strategy literature, contextualizing dynamic and operating capabilities within organizational processes of portfolio planning and product development can clarify how firms can routinely develop an adaptive capability, thus contributing to ongoing research on competitive advantage, firm evolution and growth	97
	the firm, at the dynamic capability level, plans various strategic initiatives and moves to assemble the necessary operating capabilities to execute its competitive tactics	83
	Capabilities develop at different paces and entrepreneurs need to devise strategies that account for these temporal differences as they exploit different capabilities	98

Climate Change Strategy	no relation to climate change	
Relevance for decision-making	The comparative cases are interesting because they throw into sharp relief the way that learning at the operating capability level (product development) affects decisions made at the dynamic capability level (portfolio planning) and allow us to postulate how these interactions positively or negatively affect the adaptive capacity of firms.	82
	Decision-makers perceived that the accumulated value network absorptive capacity would enable them to 'recognize the value of new information, assimilate it and apply it to commercial ends' (Cohen and Levinthal, 1990, p. 128)	93f.
Business Relevance	Managers need to recognize that their ability to adapt to external environmental changes is only one key driver of their firm's evolution. Evolution also occurs through perception of entrepreneurial opportunities that may or may not be accompanied by any external shocks.	98
	comment: exogenous shocks and endogenous entrepreneurship requires adaptive ability especially with regard to product development	
Miscellaneous		
Results	we find utility in conceptualizing dynamic capabilities as a set of capabilities specializing in the reconfiguration of operating capabilities.	96
	absorptive capacity and show its utility in understanding the interactions between dynamic and operating capabilities in circumstances of endogenous entrepreneurship --> see table 2 page 96	89
	new view on absorptive capacity: In this view, absorptive capacity emerges from the learning experiences gained from different organizational activities such as product development. (value network) --> see fig. 2 p. 91	91
	Contemporary literature has emphasized the risk-protection function of dynamic capabilities in response to exogenous shocks, failing to consider the more routine role of dynamic capabilities in reconfiguring operating capabilities based on the recognition of entrepreneurial opportunities arising from product development experiences	96
	Conversely, some dynamic capabilities lose their strategic value when they are overused, misdirected or overlooked by the firm and its management. Still, there is agreement that dynamic capabilities change the character and use of the firm's operating capabilities. (Eisenhardt and Martin, 2000; Winter, 2003; Zahra, Sapienza and Davidsson, 2006).	88
	Managerial implications: Our analyses suggest that operating and dynamic capabilities have different but complementary roles in inducing firm adaptation and evolution. This highlights a need to build and leverage these different capabilities in creative ways to identify and pursue new opportunities. Managers have to be entrepreneurial in how they assemble and exploit these capabilities	98
Criticism / Limits	Our longitudinal single case study of two firms might also suffer from peculiarities that remain untested in wider contexts (pharmaceutical related)	98
	Our theoretical generalization is also somewhat limited to firms engaged in new product development and where portfolio planning and management of the type we have described is applicable	98
Other important facts	The focus on endogenous change complements the current emphasis in the literature on how dynamic capabilities help firms cope with the risk of core rigidities following an exogenous shock.	81
	but, in the face of an exogenous shock, such routinization can potentially become the source of inertia, market irrelevance and eventually failure (LeonardBarton, 1992; Teece, Pisano and Shuen, 1997).	81
	Contemporary research highlights a need in organizations for a set of processes that critically reflect on the longevity of the relevance of current operating capabilities and the necessity for	83
	current research stresses the need for operating capabilities and strategic change	83
Further research investigations	For instance, future research could consider how the routinization of interactions between portfolio planning and product development enables/constrains the adaptive capacity of the organization in the face of exogenous shocks. Our assertion that value network absorptive capacity is a key linking mechanism carries limits to its contribution to firm adaptability in radical circumstances.	97
	Christensen (1997) argues that established firms fail to execute or leverage their dynamic capabilities because of the cognitive myopia that develops when these firms become embedded in current value networks. Under these circumstances, our notion of value network absorptive capacity may become a barrier to effective firm evolution. Future research could probe this further to better understand the traps associated with value network absorptive capacity as a linking mechanism between dynamic and operating capabilities and how firms need to build their portfolio planning capabilities to better prepare for and/or limit the adverse impacts of exogenous shocks	97
	It would also be beneficial to examine the process of actually reconfiguring and/or building new operating capabilities.	98

Name	Pellisier	
First Name	René	
Title	The implementation of resilience engineering to enhance organizational innovation in a complex environment	
Year	2011	
Co-Authors	-	
Type of Article	Theoretical Paper	
Published by	Published by Canadian Center of Science and Education	
Initiated by	University	
Ref.-ID	4726	
Ref.-type	Journal article	
Journal	International Journal of Business and Management	
Volume	6	
Issue	1	
pages	145-164	
Level of examination	Organization	
Country of origin	South Africa	
Subject	Management, Business	
Industry sector	Manufacturing	
Country	-	
Continent	-	
Ranking	If it is a Journal, then include Ranking	
ISI-Factor	-	
VHB JQ2	-	
Handelsblatt	-	
Source	BSC	
Search term	adaptive AND skill* OR competenc*OR capab* OR resource* OR abilit* AND "climat* change" OR global change OR environment* change OR "global warming" OR "extreme weather events" AND compan* OR business OR enterprise* OR organi?ation* OR management OR firm* OR corporat* OR sector OR industry AND strategy	
Abstract	<p>Becoming globally competitive has requires specific skills in developing economies as these environments are far more complex. Business as a complex system requires acknowledgement that we cannot control organizations to the degree that a mechanistic perspective will. Moreover, as the system's environment changes, so does the behaviour of its agents. Thus, the behaviour of the system as a whole can change. Linear strategies and decision making techniques become irrelevant with a shift to patterns and relationships between entities. Developing economies, especially, are more prone to the implementation of non-linear solutions because of the nature of the variables, the changes and interplays between the variables, the significant human focus and the consequent organic nature of the competitiveness. These variables introduce an unavoidable element of unpredictability/randomness into any management decisions. Complexity allows for pattern recognition which requires focusing on competencies, activities, technologies or resources signaling patterns that will impact on innovation, especially with respect to organizational, management and technological forms. Technology as knowledge is an intrinsic part of the pattern recognition the implementation of the above forms of innovation. This paper discusses the role of non-linear management theories in a complex environment with regards to these innovations. In this sense, a resilience engineering approach provides the space for innovation implementation and the focus on organizational and management innovation through complex adaptive systems. The literature abounds with research on product and process innovation but less is said about organizational, management or technological innovation and their implementation</p>	
Code	Segment	page
	This paper discusses the role of non linear management theories in a complex environment with regards to these innovations.	145
Aim of article	This is a position paper presenting an 'academic' perspective on the question on what is beyond current innovation practices with regards to organizational renewal.	145
	This paper redefines innovation in terms of the complexity of the world of work currently experienced and links resilience engineering and complexity for new forms of innovation in terms of its organization and its management.	146

Adaptive capacity	
Definition	<p>Innovation is knowledge used in a unique and different way. Innovation is new thinking. That thinking can be radical, disruptive or incrementally different. But it is not more of the same. It is renewal and renovation. 146</p> <p>Acting knowledgeable, rather than repetitively, is becoming critical because not only does it prompt learning from experience and provide insight into possible commercial futures, it is hard to imitate and can be strategically distinctive (Kogut and Zander, 1992). Innovation is generally the result of cumulative dynamic interaction and learning processes involving many stakeholders. Here innovation is seen as a social, spatially embedded, interactive learning process that cannot be understood independently of its institutional and cultural context. 146</p> <p>We define innovation as a continuum of activities as below: Innovation as renovation is the outcome of a series of interrelated activities on a continuum, starting with creative discovery, then entrepreneurship, and, finally commercial exploitation. In this, leadership is redefined, processes, systems and culture may be redesigned and organizations search for and find new meaning. This definition allows for product/process innovation but also includes organizational/management/technological innovation activities. 146</p> <p>The role of complexity science (and complex adaptive systems) in business is well explained (Elliott, 1999). Simply defined, complex adaptive systems are composed of agents that interact with each other and, in doing so, generate new behaviours for the systems as a whole (Lewin & Regine, 2001). 152</p>
Thesaurus	<p>The concept of resilience has reached maturity over the past decade. Robb (2000) defines a resilient organization as one able to sustain competitive advantage through its capability to (1) deliver excellent performance against current goals, whilst, in paradox, (2) effectively innovating and adapting to rapid, turbulent changes in the environment. 155</p> <p>Resilience has four primary attributes: capacity, flexibility, tolerance, and inter-element collaboration. Capacity requires that the system be sized to handle the maximum and most likely events, such as terrorist attacks and natural disasters. However, a system cannot depend on capacity alone; the other attributes must be present to handle unpredicted events. Capacity includes functional redundancy. Flexibility requires the system to be able to reorganize. For example, plans must be in place to allow the command and control to shift upwards in the event of a serious disruption, such as a terrorist attack. Tolerance allows the system to degrade gracefully in the face of an attack. That is, all resources would not become inoperative after the first strike. 156</p> <p>Resilience engineering (as in Figure 4) allows for two juxtaposed views of management and thereby allows for (1) the generation of conceptualisation (alternative ways to understand and define a problem or opportunity), (2) optimisation (alternative ways to get an idea to work in practice and uncovering all factors to successful implementation), (3) generation (new opportunities and problems that can be capitalized on) and (4) implementation (new actions and results to gain acceptance of a new idea) of options in order to implement organizational/management/technological innovation. While this is being done, we will think about the really important question of what lies beyond innovation (other than more real innovation) if anything. And we think it might have to do with creativity and resilience in order to become globally competitive. 157</p> <p>Smith (2010) identifies four types of innovation based on the work done by Henderson and Ciark (1990): incremental (refining and improving the existing design within an established architecture), modular (use is made of new technology and components, within an existing system); architectural (an established system links existing components in a new way), and radical (involving a total new design using new components). In the last case the innovation can be disruptive. 146</p> <p>To a certain extent, most of these can be achieved by the implementation of complex systems and the concept of resilience engineering to the business fundamentals. 147</p> <p>But real innovation comes from the inner self and individual contributions (in figure 1 we used creativity and entrepreneurship in this regard) and thoughts need to be given a place in organizations and in society to breed. We maintain that innovation takes place in the specific domains of product, process and/or service. However, there is more: innovation also takes place in leadership, culture, processes and systems, design, products and technology 148</p>
Characteristics	<p>As informationologists, we believe in the advantage and power of information and knowledge. If we try really hard, it is possible to design appropriate systems and technologies in place to obtain these. 148</p> <p>That makes Information Science and Knowledge Management possible. Creating space for innovation is more complex as it is not derived out of systems and technologies and has no theory to guide it; it comes from the inner self and only to those who are not afraid of newness. 148</p> <p>These organizations exhibit particular characteristics in the sense that they (1) can create structure and dissolve it; (2) provide safety in the face of change (although this is not necessarily security or stability); (3) manage the emotional consequences of continuous transformation, change, anxiety and grief; and, (4) learn, develop and grow. 155</p>
Adaptation	<p>Danah Zohar (1990) believes that 'Most transformation programmes satisfy themselves with shifting the same old furniture about in the same old room. Some seek to throw some of the furniture away. But real transformation requires that we design the room itself. Perhaps even blow up the old room. It requires that we change the thinking behind our thinking - literally that we learn to rewire our corporate brains. 'Zohar's 'real transformation' is really innovation. 148</p>

Strategy	
	When we relate business to a complex adaptive system (also called a learning system (Robb, 2000), we look for ways to successfully adapt to changing environmental conditions. Complexity science focuses on relationships between individuals, teams or between organizations and businesses. 153
	Complexity allows a two tiered focus in business: (1) its performance system (responsible for the performance of current goals and tasks for immediate survival), and (2) its adaptation system which is responsible for the long-term sustainability through the generation of new ideas, operations and behaviours. It generates possible futures for the total systems. Successful resilient organizations should be robust in terms of both subsystems but tend to concentrate on only one (Robb [50]). 153
	However, it makes out innovators and their contributions to be different and it links leadership and people (more than technology) to innovation. This links innovation to quantum thinking and complexity science. 149
	The quantum thinking paradigm is not a bad one as [quantum mechanics] ' does not predict a single definite result for an observation. Instead, it predicts a number of different possible outcomes and tells exactly how likely each of these is '. 149
	Zohar (1997) implies that through thinking differently, one can help create new ideas for organizational design; she states that, ' The essence of quantum thinking is that it is the thinking that precedes categories, structures, and accepted patterns of thought' (Zohar, 1997: 21). Thus quantum' thinking, in line with complex environments, will lead to new organizational theories in design and subsequently leadership definitions to cope with these in organizations. 150
Strategy development	The first shift must be a shift to systems thinking and the second shift moves structured organizational dynamics into the organising dynamics of a living system. The future of integrated extended organizations and value chains is inherent in the value or 'meaning'. Wheatley sees this dynamic organizational system as a relationship of networks. The integration of this dynamic system, writes Wheadey (1999), is through the three elements of (1) identity (ability to manage the shapes in motion of an organization around a central tenant of meaning), (2) information (the integration of organizational learning) and (3) relationships (eyond the traditional boundaries to establish relationships with people anywhere in the system), as supported by Jaworski (1996) and Kilman (2001), where Kilman states that in quantum organizations, acdve participants must have empowered and empowering reladonships. 150
	External factors influence the organizations' direction, organizational sturcture and internal processes. These factors that exist in the organizations' remote, industry and operating environments require constant monitoring for the formulation of strategies to optimise the organizations market opportunities and threats to allow them to survive in their competitive environment (Pearce & Robinson, 2005). 154
	Strategic Competitiveness is achieved by an organization when it successfully formulates and implements strategy which creates value. 154
Climate Change Strategy	The pace of change and reform has increased the speed at which organizations are required to define strategy, but has not removed the need for a sturctured strategic management process. Strategic Management is an integral part of the mning of an organization, but require strategic decisions to be based on valid, and actionable intelligence, rather than the ideals, on which the organizations visions are based 154
	Complexity allows for patten recognition which requires focusing on competencies, activides, technologies or resources signaling patters that will impact on innovation, especially with respect to organizational, management and technological forms. 145
Relevance for decision-making	They further identify a single problem as a discrepancy between two states, the existing state and the desired state of affairs. Furthermore, once the problem has been defined, decision criteria are to be idenfied. These decision criteria are factors that are relevant in the decision making process and could eliminate certain courses of action. 155
	Moreover, as the system's environment changes, so does the behaviour of its agents. Thus, the behaviour of the system as a whole can change. 145
Business Relevance	There is no denying that the fliture world of work will be different. There are numerous signs of environmentalchanges, for instance, (\\) politics: the threat of India and China as new world powers, and possible demise of Africa, the war on terror, the issue to secure oil and other resources and human rights violations; (2) economic turbulence caused by globalization and de-regulated markets and new technology; (3) globali-zation and de-regulated markets that will remove barriers, increase free trade, create more and more consumer choice (companies can no longer rely on regulations to protect their business, the most significant competitor will not come from current industry, governments are stripped of power and increase the power of the consumer); (4) technology: the decreasing price boom, raw material prices and commodities will fall and the computer and telecommunications industry have provided the platform for e-commerce; (5) the knowledge economy: primary resources have become far more intangible and difficult to contain. Knowledge and information have no value until it is used for a specific purpose; (6) global warming and sustainabilify (Copenhagen Diagnosis, 2009); intemational terrorism and piracy 152
Miscellaneous	
Results	-
Criticism / Limits	-

	Up until recently, we would have maintained that information technology (IT) is unambiguous. That is still true. But beyond that (e.g. IT), value lies in the information and knowledge obtained, distributed, shared, distributed and created. And, when that is done, innovation begins	146
Other important facts	There are five primary principles to operate in a complex reality Lewin & Regine (2001). These are: (1) agents interact and mutually affect each other in a system: This focuses on relationships between and among people, teams and companies, (2) agents' behaviours in a system are governed by a few simple rules: In business, rules become practices. These practices are guided by shared values and beliefs (3) small changes can lead to large effects, taking the system to a new attractor: Multiple experimentation on a small scale is the most productive way to lead change rather than to attempt to leap too quickly to a perceived desired goal on a large scale (4)	152
	emergence is certain, but there is no certainty as to what it will be: Create conditions for constructive emergence rather than trying to plan a strategic goal in detail. This includes nurturing the formation of teams and creativity within teams and evolving solutions to problems (not designing them). Hierarchical and central control should give way to distributed influence and a flat organizational structure. (5) the greater the diversity of agents in a system, the richer the emergent patterns: Seek diversity of people in terms of culture, expertise, age, personalities and gender, so that people interact in teams (thus creativity has the potential to be enhanced).	153
	Twenty first century enterprises functioned in a relatively simple, stable and predictable environment. As a result, managers were able to make decisions based on intuition or by repeating procedures successfully used by other executives or used in the past.	153
Further research investigations	-	

		45
Name	Peteraf	
First Name	Margaret	
Title	Managerial discretion and internal alignment under regulatory constraints and change	
Year	2007	
Co-Authors	Reed, Randal	
Type of Article	Research Paper	
Published by	John Wiley & Sons, Inc.	
Initiated by	University (Tuck School of Business at Dartmouth)	
Ref.-ID	4707	
Ref.-type	Journal article	
Journal	Strategic Management Journal	
Volume	28	
Issue	11	
pages	1089-1112	
Level of examination	Organization	
Country of origin	USA	
Subject	Business; Management	
Industry sector	Transport, Storage and Communications	
Country	USA	
Continent	North America	
Ranking		
ISI-Factor	4.464	
VHB JQ2	A	
Handelsblatt	0.7	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND business	
Abstract	This paper investigates the effects of regulatory constraints and their relaxation on managerial discretion and internal fit in the context of the U.S. airline industry. Our results suggest that when managers' discretion is limited in one realm of choice, they compensate by using their greater level of discretion in some other arena to achieve internal fit. We show that the pursuit of fit matters, in the sense of having measurable efficiency consequences, and that fit trumps 'best practice,' at least in this context. In this respect, our findings provide a validation of the contingency perspective on internal fit. The ability to achieve fit under changing conditions may express a dynamic managerial capability necessary for adaptive organizational change.	
Code	Segment	page
	This study, at its most fundamental level, is a validation of contingency theory. It follows a long tradition of research supporting a connection between internal alignment and superior organizational performance	1089
Aim of article	This paper investigates the effects of regulatory constraints and their relaxation on managerial discretion and internal fit in the context of the U.S. airline industry. Our results suggest that when managers' discretion is limited in one realm of choice, they compensate by using their greater level of discretion in some other arena to achieve internal fit.	1089
Adaptive capacity		
	On average, they chose a set of practices and processes that fit the constrained choice variables and allowed them to operate relatively efficiently. This suggests an adaptive capacity and degree of organizational resiliency during the regulatory era that may be insufficiently appreciated (Meyer, Brooks, and Goes, 1990).	1091
Definition	use the term but do not define the term adaptive capacity --> only used as a description for possible behaviors and outcomes of managers	
	We also suggest a more specific mechanism underlying a dynamic managerial capability (Adner and Helfat, 2003) for achieving dynamic fit, facilitating organizational adaptation under changing conditions.	1091
Thesaurus	we draw on managerial discretion theory (Hambrick and Finkelstein, 1987) to enrich the contingency perspective. This allows us to portray managers as taking an active role in adapting to varying constraints and to consider the effect of those constraints on their actions	1090

	The notion of fit suggests an alignment among things internal to a firm, such as strategy and structure (Chandler, 1962) or strategy and organizational activities (Porter, 1996). It also suggests external alignment, matching organizational structure with the contextual environment or matching strategy with environmental needs.	1089
Characteristics	2 types of managerial choice: "operational variables" and "administrative practices."	1090
	This is curious, given that the achievement of fit implies the need for adaptation, itself a dynamic concept.	1093
Adaptation	Miles and Snow (1994) draw attention to the importance of dynamic fit.	1093
	This, of course, leads directly to problems in trying to operationalize the concept, including how to measure fit and test for its existence as well as its effects	1093
	The more recent work on organizational adaptation along rugged fitness landscapes (Levinthal, 1997)	1093
Strategy		
	'structure follows strategy' as assumption for this work (Chandler)	1092
Strategy development	We find that even under regulatory constraints strategic choice plays an important role in the efficient management of organizations	1091
	We investigate the effects of regulatory constraints and their relaxation on two broad types of managerial choices in this industry: those that were constrained directly by regulation, which we dub 'operational variables,' and those that were constrained only indirectly, which we call 'administrative practices.'	1090
Climate Change Strategy	no connection to climate change	
Relevance for Decision-making	Constraint,' as Hambrick and Finkelstein (1987: 374) remind us, 'is the obverse of discretion.' They suggest that under long-term environmental constraints the decision-making capacity of organizations may atrophy. Under such conditions, performance is determined primarily by other factors, suggesting that management matters relatively little. --> this study shows the opposite --> management still matters	1091
Business Relevance	The results of our study suggest otherwise. We find that even under regulatory constraints strategic choice plays an important role in the efficient management of organizations	1091
Miscellaneous		
	'When managers are sharply constrained on some fronts, they are well served by adopting administrative practices that accommodate those constraints—even if those practices are not the most advanced, enlightened, or sophisticated practices available.'	1091
Results	Our findings, while only suggestive, indicate that airline managers, on average, were surprisingly adaptive, even under regulation	1091
	The results of this study suggest that, at least in this context, fit trumps 'best practice.' Somewhat surprisingly, there would have been no efficiency gains from applying the new administrative practices to the old set of operating variables.	1091
	managers play in influencing the organization's situation, including its strategy, structure, processes, and competitive context	1094
	managers, as a group, are remarkably adaptive, even under the constrained conditions of governmental regulation	1105
	It suggests that when managers find that their discretion is limited in one arena, they adapt by exercising their discretion in a less constrained arena.	1106
Criticism / Limits	The second such limitation stems from the fact that the airline industry was deregulated in a gradual fashion (Bailey et al., 1985). [...] As a consequence, managers may not have had time to fully adjust the fit between their administrative practices and the operational choice variables during either period that we examined.	1106
	The first, leveled most strongly at the early contingency theorists, was that the theory was overly deterministic	1092
Other important facts	A 'systems approach to fit' within structural contingency theory (Drazin and Van de Ven, 1985) that relied on the identification of internally consistent gestalts, or ideal types, emerged as a reaction against reductionism. Within the field of strategy, such approaches are called configurational (Miller, 1986, 1996; Meyer et al., 1993). They include studies involving typologies, such as Miles and Snow's (1978), as well those employing taxonomies, such as Miller and Friesen's (1977).	1092
	After years of waning interest, academic interest in fit and the contingency perspective appears to be on the upswing once again. This is particularly evident in the field of strategic management.	1093
	Similar ideas are found within the resourcebased view (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993a). Penrose (1959), Rumelt (1984) and others have emphasized the importance of bundles of resources and capabilities. Like activity systems, their complexity and ambiguity have implications for both organizational heterogeneity as well as sustainable competitive advantage	1094

	Within the dynamic capabilities literature, the concepts of co-specialized assets (Teece, Pisano, and Schuen, 1997) and complementary assets (Dierickx and Cool, 1989) also reflect the theme of contingent fit. Recent empirical work has begun to connect the resource-based view to the concepts of strategic fit and complementarities even more explicitly	1094
Future research investigation	Our findings suggest several other fruitful avenues for future research. One possibility is to conduct a similar study to see if the differential responses to regulation and change vary by strategic type, such as Miles and Snow's (1978) categories	1106
	investigation at a more micro level. This type of behavior might also be characterized in terms of how managers develop and exercise a dynamic capability for maintaining fit over changing conditions	1107

		46
Name	Pielke Jr.	
First Name	Roger	
Title	Weather-related losses in the built environment: societal change and climate change	
Year	2008	
Co-Authors	-	
Type of Article	Review	
Published by	Counselors of Real Estate	
Initiated by	University	
Ref.-ID	4641	
Ref.-type	Journal article	
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Volume	33	
Issue	3	
pages	9-14	
Level of examination	Industry	
Country of origin	USA	
Subject	Environmental Studies	
Industry sector	Construction (Property Insurance)	
Country	USA	
Continent	North America	
Ranking		
ISI-Factor	-	
VHB JQ2	-	
Handelsblatt	-	
Source	BSC	
Search term	"adaptive capacity" AND climat* change AND strategy AND compan*	
Abstract	<p>Economic losses due to extreme weather events such as floods and tropical cyclones have increased dramatically in recent decades. Despite concerns among many scientists about the relationship of greenhouse gas emissions to climate extremes, the major reason for these losses is population growth and the location of property in harm's way. Looking to the future, the role of societal development will almost certainly continue to overshadow projected changes in the frequency and/or intensity of storms and floods. This means that effective policies to address ever-escalating losses must focus on what, how, and where we build in regions prone to extreme events.</p>	
Code	Segment	Page
Aim of article	-	
Adaptive capacity		
	Climate change, regardless of cause, may require a broader perspective in adaptive capacity than has been the case in the past	13
Definition	-	
Thesaurus	-	
Characteristics	-	
Adaptation	-	
Strategy		
Strategy development	-	
Climate change strategy	-	

Relevance for decision-making	Decisionmakers might embrace more fully an alternative approach to decision-making, e.g., one based on no-regrets vulnerability reduction or proactive risk management.	14
Business relevance	-	
Miscellaneous		
Results	-	
Criticism / Limits	-	
Other important facts	-	
Further research investigations	-	

47	
Name	Porter
First Name	Michael E.
Title	A Strategic Approach to Climate
Year	1995
Co-Authors	Reinhardt, F.L.
Type of Article	Theoretical Paper
Published by	Harvard Business School Publication Corp
Initiated by	University
Ref.-ID	4665
Ref.-type	Journal article
Journal	Harvard Business Review
Volume	85
Issue	10
pages	22-26
Level of examination	Organization
Country of origin	USA
Subject	Business, Management
Industry sector	-
Country	-
Continent	-
Ranking	
ISI-Factor	1.665
VHB JQ2	D
Handelsblatt	0.4
Source	Journal
Search term	Searched within Journal
Abstract	-

Codings sheet due to technical reasons not integrated.

Name	Porter
First Name	Michael E.
Title	Green and competitive
Year	1995
Co-Authors	van der Linde, C.
Type of Article	Research Paper
Published by	Harvard Business School Publication Corp
Initiated by	University
Ref.-ID	4629
Ref.-type	Journal article
Journal	Harvard Business Review
Volume	73
Issue	5
pages	120-134
Level of examination	Organization
Country of origin	USA
Subject	Management, Business
Industry sector	Manufacturing
Country	-
Continent	-
Ranking	
ISI-Factor	1.655
VHB JQ2	D
Handelsblatt	0.4
Source	Journal
Search term	Searched within Journal
Abstract	<p>The lingering belief that environmental regulations erode competitiveness has resulted in a stalemate. One side pushes for tougher standards, the other tries to roll standards back. The prevailing view is that there is an inherent and fixed trade-off: ecology versus the economy. On one side are the social benefits that arise from environmental standards. On the other side are the private costs to industry of prevention and cleanup that lead to higher prices and reduced industrial competitiveness. This static view, in which everything except regulation is held constant, ignores the fact that companies are constantly finding innovative solutions in response to pressures of all sorts--from competitors, from customers, from regulators. The authors' research shows that tougher environmental standards can enhance competitiveness by pushing companies to use resources more productively. The concept of resource productivity opens up a new way of looking at this complex issue. Today managers and regulators focus on the actual costs of eliminating or treating pollution. To end the stalemate, they should focus instead on the enormous opportunity costs of pollution--wasted resources, wasted effort, and diminished product value to the customer. Managers must start to recognize environmental improvement as an economic and competitive opportunity, not as an annoying cost or an inevitable threat. Environmental progress demands that companies innovate to raise resource productivity--precisely the new challenge of global competition. It is time to build on the underlying economic logic that links the environment, resource productivity, innovation, and competitiveness.</p>

Codings sheet due to technical reasons not integrated.

		49
Name	Prieto	
First Name	Isabel Ma	
Title	Assessing the Impact of Learning Capability on Business Performance: Empirical Evidence from Spain	
Year	2006	
Co-Authors	Revilla, Elena	
Type of Article	Research Paper	
Published by	Sage Publications, Ltd.	
Initiated by	University	
Ref.-ID	4620	
Ref.-type	Journal article	
Journal	Management Learning	
Volume	37	
Issue	4	
pages	499-522	
Level of examination	Organization	
Country of origin	Spain	
Subject	Business, Organization	
Industry sector	Cross-sector	
Country	Spain	
Continent	Europe	
Ranking		
ISI-Factor	1.33	
VHB JQ2	B	
Handelsblatt	0.4	
Source	Reference list	
Search term	Searched within reference list	
Abstract	It is widely recognized that the development of learning capability is key to achieve a durable competitive advantage. However, the analysis of the relevance of learning capability to improve business performance and, thus, the organizational competence has been insufficiently developed in literature. Based on data from 111 Spanish companies, this article explores the link between learning capability and the improvement of business performance by comparing how the main dimensions of learning capability—stocks of knowledge and flows of learning—impact on performance, in terms of both non-financial and financial performance. The results show that those organizations with the highest levels in their knowledge stocks and learning flows obtain a superior performance.	
Code	Segment	page
	Research has rarely focused on the analysis of the consequences of learning capability on business performance and competitiveness.	499
Aim of article	The ambition of the present study is to explore the link between learning capability in organizations and business performance and, ultimately, to determine how learning capability is associated with a better performance.	500
Adaptive capacity		
Definition	-	
	Although many authors on organizational learning have shown the importance of the learning capability, it is difficult to give an explicit definition of the concept	500
Thesaurus	2 reasons for learning : "In essence, it is often recognized that organizations learn for two basic purposes: to explore new opportunities and to exploit existing ones (March, 1991)"	499
	Organizational potential to learn are made by using the link between knowledge and its associated learning processes. Knowledge is an established theoretical construct that has been proposed as a key firm resource and a source of competitive advantage (comment: sth. companies have)	500

	Definition of Learning: "Learning can be considered as a process of change on knowledge and a process of change on knowing, which involves changes in cognition and changes in behaviour (Vera and Crossan, 2003)"	500
	2 dimensions of learning: "Knowledge and knowing can then be considered as the content of learning processes" [...] the concepts of knowledge, knowing and learning are closely related	500
Characteristics	On this matter, several authors (Crossan et al., 1999; Dierickx and Cool, 1989) argue that all organizations uphold a stock of knowledge, tacit or explicit, which needs to continually flow through learning processes to act in agreement with the environmental requirements. Stocks of knowledge refer to all that is already known or needs to be known, which includes knowledge and knowing at the individual, group and organization levels. Learning flows are more concerned with relationship and interconnection. They are about the interaction of knower(s) between themselves and with the world (using knowledge stocks as a tool)	500f.
	It is also considered that learning flows are the processes through which knowledge and knowing are generated, retained, transferred and utilized (Prieto, 2003). They are essential to understand how knowledge stocks are integrated and translated into competence .	501
	The link between learning flows and knowledge stocks is reflected in the tension between the exploration and the exploitation of knowledge (Crossan et al., 1999; March, 1991). The firm renews itself through the exploration processes and new knowledge is created and assimilated (institutionalized)	501
	4 types of learning capabilities: Where there are low levels of both knowledge stocks and learning, there is a minimized learning capability. In the current turbulent business environment, this configuration matches to organizations that barely change, and they are probably mature or simply stagnated. [...] The contrary to former situation is an advanced inclusive learning capability where there are both large levels of knowledge stocks and learning flows. This characterizes a configuration where the interrelation between knowledge stocks and learning flows balances the potential to develop, maintain, apply and improve abilities, qualities and activities in such a way that they become a source of sustainable competitive advantage. [...] When there is a bias towards high levels in learning flows, we have a dynamic learning capability prompted by the need to exploit temporary competences that are rapidly substituted through knowledge exploration. [...] Finally, when learning capability is biased to large immobile stocks of knowledge there is a static learning capability. This is possible in the case of big and/or experienced organizations, with a strong tradition or with some kind of well-established competitive advantage.	504
	Importance fo absorptive capacity: On the other hand, knowledge stocks are obtained through learning flows, but cannot be adjusted instantaneously. In this sense, it is important to keep in mind that knowledge stocks may result not only from internal learning flows, but also from the assimilation of external knowledge.	518
Adaptation		
Strategy		
Strategy development	Comment: Learning as a core competence (?)	503
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	In the present competitive scenario, characterized by continuous changes and profound dynamism, companies widely identify learning capability as a critical attribute for achieving and retaining competitive success. Firms need to transform and refine their knowledge bases in accordance with the environmental conditions, and this is possible through learning processes.	499
	In other words, business performance is not an ultimate consequence of learning capability, but may help to discern the existence of a knowledge gap that needs to be filled	503
Miscellaneous		
Results	A strong knowledge stock has been found to increase efficiency in new product development (Brockman and Morgan, 2003), organizational improvisation (Weick, 1993), recombination of prior routines (Holland, 1975), and absorptive capability (Cohen and Levinthal, 1990).	505
	The research directly underlines the significance of the different configurations between knowledge (stocks) and learning (flows) for an improved business performance.	517
	The results support that differences in business performance exist as a result of differences in learning capability.	517
	However, we must have in mind that knowledge stocks depreciate with time, especially in dynamic environments. Learning flows are then necessary to strengthen and rebuild knowledge stocks so that the firm may preserve its competitive advantage.	518

	Moreover, those organizations with the highest levels of interaction between knowledge stocks and learning flows are the ones that obtain a better non-financial and financial performance.	518
	The results show that those organizations with the highest levels in their knowledge stocks and learning flows obtain a superior performance (comment: transferable to adaptation?)	499
Criticism / Limits	But even when we have tried to define our variables as precisely as possible by drawing on relevant literature, and to closely link our measures to their theoretical underpinnings, the measurement items used here can realistically be thought of as only proxies for an underlying and latent phenomenon that is neither fully nor easily measurable	519
	In relation to business performance, the absence of objective data is a clear limitation	519
	A second limitation concerns the fact that all data were collected from the same respondent using the same perceptual measurement technique.	519
Other important facts	The efficiency of learning depends on how exploration and exploitation flows continuously to provide knowledge stocks to the company and its members by elaborating, supporting and contradicting existing knowledge stocks (Bontis, 1999).	501
Further research investigations	But future research should attempt to assess the degree in which business performance provides important feedback about the efficiency of learning capability and, ultimately, enables future learning capability. The purpose should be to test the existence of a retroactive effect that ties learning capability and performance in a continuous loop	519
	Finally, future research should also identify antecedents or enablers of learning capability and elaborate a comprehensive framework of both enablers and outcomes	519

		50
Name	Reed	
First Name	Ken	
Title	Organizational flexibility in Australia	
Year	1998	
Co-Authors	Blunsdon, Betsy	
Type of Article	Research Paper	
Published by	Routledge	
Initiated by	University (Monash University)	
Ref.-ID	4714	
Ref.-type	Journal article	
Journal	International Journal of Human Resource Management	
Volume	9	
Issue	3	
pages	457-477	
Level of examination	Organization	
Country of origin	Australia	
Subject	Business, Organization	
Industry sector	Cross-sector	
Country	Australia	
Continent	Australia	
Ranking		
ISI-Factor	0.830	
VHB JQ2	B	
Handelsblatt	0.4	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND business	
Abstract	<p>This paper presents a typology that distinguishes two types of flexible organizations based on the clarity of purpose and the extensiveness of formal rules. The analysis shows that these forms of flexibility are related to whether organizations engage with their environments reactively or strategically. One form (strategic flexibility) is evident in a 'goal-directed' type of organization (having clear goals but low levels of formal rules), and the other can be observed in an informally-organized type (lacking clear goals, and with limited formal rules). These are compared with two other types: formally-organized (clear goals and extensive formal rules); and rule-governed (lacking clear goals, extensive formal rules). An analysis of a sample of fifty organizations shows clear differences between the four types with respect to contextual factors; environmental conditions; strategy and structure; and integrative mechanisms.</p>	
Code	Segment	page
	This paper presents the results of the Australian component of an international collaborative project which aims to investigate country differences in 'organizational flexibility'. An underlying premise in this project is that organizations operate in national contexts, and so organizational form will reflect variation in labour-market and industrial-relations conditions (Reed 1995).	458
Aim of article	This paper presents results of a survey of fifty multinational and locally owned organizations operating in Australia	458
	These preliminary results of an exploratory analysis examine the relationship between flexibility and: contextual factors; environmental conditions; strategy and structure; and integrative mechanisms.	458
Adaptive capacity		
	However, organizational flexibility emerged as a major issue in the 1980s in response to a perceived need for increased organizational adaptive capacity because of greater competitive pressure (Atkinson, 1984, 1987; Pollert, 1988a, 1988b; Atkinson and Meager, 1986).	457
	The major issue in analysing flexibility is the question of whether it enhances an organization's capacity to adapt to unstable conditions.	467

Definition	no direct definition of adaptive capacity but organizational flexibility similar defined --> see Thesaurus; authors see flexibility as sth. that might enhance adaptive capacity --> see page 467f.	
	Organizational flexibility can be defined broadly as an organization's capacity to adjust its internal structures and processes in response to changes in the environment.	457
	There have been a variety of conceptualizations of flexibility each focusing on different core variables.	459
Thesaurus	The analysis presented here is based on a simple conceptualization of organizational flexibility derived from two basic premises; that 'flexibility' • is antithetical to high levels of formalized rules and regulation, and • connotes the capacity to respond purposively in the face of perceived changes in conditions.	459
	Flexibility' is investigated by comparing these organizational types - formally organized (high goals and high rules); informally organized (low goals and low rules); rule governed (low goals and high rules); and, finally, goal-directed (high goals and low rules) as the exemplar of the strategically flexible organization. (see typology page 460 fig. 1)	461
	Consequently, it is argued, flexible organizations are characterized by low levels of formal regulation and clarity of purpose	459
Characteristics	Formal regulation: Formalized regulations can increase both the efficiency and effectiveness of organizations. [...] by reducing the need to derive a solution for each unique situation by standardizing and formalizing past routines for future use. They can contribute to [...] define organizational capabilities and shape members' behaviour. [...]	459
	BUT: However, formal regulation is antithetical to flexibility both at the level of the organization and at the level of the individual employee.[...] If conditions change, then formal regulations can constitute constraints on the capacity to organize work in ways that are appropriate to the new conditions. [...] individual level: employees need to have the discretion and autonomy to respond to changing circumstances where and when new or non-routine problems occur.	459
	Purpose: However, the absence of rules is also a characteristic of disorganization and without goals organizational behaviour can become random subject to the pressures or forces operating at any point in time.	459
Adaptation	Clearly, the more turbulent the environment the greater the extent to which rules can potentially impede an organization's ability to respond appropriately. In other words, the organizational advantage from formal rules is relative to the rate of environmental change. (Formal regulation)	459
	The focus of this analysis emerges from contemporary interests in flexibility - the need for internal adaptation in response to rapidly changing external circumstances - and concentrates on the need for formal organizations (in contrast to loosely coupled informally organized organizations) to have adaptable internal arrangements.	460f.
Strategy		
Strategy development	It is easy to accept that inflexibility will be associated with management systems that rely heavily on tightly controlling organizational behaviour through the use of formal regulation. However, low levels of formal regulation can be conducive to poor organization or organizational processes that are no more than reactions to external demands. By contrast, the existence of clear direction or goals enables a strategic orientation to coexist with a flexible organizational design.	460
	goal-directed (high goals and low rules) as the exemplar of the strategically flexible organization	461
	(a) how the organization orients itself to the market in terms of whether it is reactive or proactive and whether it focuses on niches or the mass market: and (b) the extent to which HRM practices display a strategic (proactive) or tactical (reactive) orientation. Organizational flexibility is itself largely structural. However, it is important to assess the extent to which other structural factors are associated with flexibility.	468
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	This empirical interest has been argued to be a response to the economic and political changes of the 1970s and 1980s (Blyton, 1991a, 1991b; Legge, 1995; Reed, 1992, 1996) and has manifested as interest in flexibility both at the microorganizational level (such as Atkinson's 1984 model of the 'flexible firm') and also in analyses of macro-level economic and political shifts which have implications for production technologies, markets and industrial organizations (Piore and Sabel, 1984; Harvey, 1989; Hirst and Zeitlin, 1991).	457
Miscellaneous		
Results	Survey was analyzed by industry group, size, age and ownership; relation to environmental conditions; strategy and structure (Corporate Strategy, HRM strategy, Structure) and Integration	462ff.

	Industry: It suggests that hotels, hospitals and transport companies tend to be less goal-directed in comparison to airlines, accounting firms and financial institutions. [...] Organizations in the airline industry appear to rely less on organizational rules than do hotels, hospitals and transport firms.	463
	A 'flexibility' dimension can be pictured by running a line at 45° through the display (equivalent to a rotation in factor analysis). Hotels, hospitals and transport firms would be located at the least flexible location (near G-R +), while airlines would be located at the most flexible location (G+R-)	463
	Size: Very small organizations are more likely to be informally organized while large organizations tend to be formally organized, telling us unsurprisingly, that, as organizations get larger, they tend to formalize goals and rules.	464
	Age: However, Figure 4 shows that the relationship is more complex than this: the relationship between age and organizational type is not statistically significant (p=0.34) but the pattern clearly shows that 'maturity' is associated with goal-directed flexibility. [...] This is related to age in a complex way. In that both the oldest and the youngest organizations tend towards the formally organized point.	464f.
	This highlights 'flexibility' as a capacity to react to changing conditions that is associated with informal organization.	466
	Environment: We find on this dimension that there is a close association between stable conditions and the importance of reputation. By contrast, unstable conditions are associated with price-based competition or special technology and, interestingly, this is where 'typical' organizations are found. Overall, though, the analysis provides little insight into the question of whether organizations develop flexible forms of organizing under particular conditions. Instead, the most prominent feature is the association between rule-governed organization, reputational importance and environmental stability.	467
	Strategy: The analysis of the relationship between corporate strategy and flexibility, displayed in Figure 7. is not statistically significant but does suggest potentially interesting lines of enquiry. [...] The display in Figure 7 can be interpreted as four quadrants. The top left-hand quadrant comprises customer-driven production for mass-markets. It is here that the goal-directed and informally organized variations of flexibility occur. By contrast, formally organized firms are located in the bottom right quadrant - characterizing a proactive, niche-market strategy, Rule-governed firms are located in the supply-driven, mass-market domain.	469
	Structure: Not surprisingly, there is a highly significant relationship between structural factors and flexibility. [...] This dimension shows that structural complexity is associated with less flexibility. Both informally organized and goal-directed organizations tend to display a simple structural configuration, characterized by both low functional differentiation and low vertical differentiation.	471
	Integration: Overall, though, the main conclusion to be drawn is that flexible organizations tend not to formally disseminate information.	472
Criticism / Limits	-	
Other important facts	Despite intense interest in organizational flexibility, as evidenced by the debates which have arisen concerning the nature and impact of flexibility the concept has remained vague and ambiguous.	458f.
Further research investigations	There is clearly a need for an historical perspective on organizational development in order to identify, within strategically flexible organizations, the critical points at which key re-structuring and redesign decisions were successfully implemented. Of particular importance here is the question of scope of operations given that international firms were more likely than local (Australian) firms to be of the strategically flexible type	475

		51
Name	Schindehutte	
First Name	Minet	
Title	Advancing strategic entrepreneurship research: the role of complexity science in shifting the paradigm	
Year	2009	
Co-Authors	Morris, Michael H.	
Type of Article	Theoretical Paper	
Published by	Wiley-Blackwell	
Initiated by	University	
Ref.-ID	4682	
Ref.-type	Journal article	
Journal	Entrepreneurship: Theory & Practice	
Volume	33	
Issue	1	
pages	241-276	
Level of examination	Organization	
Country of origin	USA	
Subject	Business	
Industry sector	-	
Country	n. A.	
Continent	n. A.	
Ranking		
ISI-Factor	1.704	
VHB JQ2	A	
Handelsblatt	0.5	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND business	
Abstract	Five areas are identified wherein more development might enhance the current model of strategic entrepreneurship (SE): exploration–exploitation, opportunity, newness, micro–macro interaction, and dynamics. Complexity science is presented as an alternative theoretical lens for addressing these issues, and enhancing the potential of SE in a world characterized by fluctuations, irreversibility, nonlinearity, and instabilities. Using this lens, a rearticulation of SE is proposed that centers on the notion of an opportunity space and a paradigm built around forms, flows, and functions. SE's domain consists of a complex set of phenomena that cannot be neatly bundled according to disciplinary boundaries.	
Code	Segment	page
Aim of article	-	
Adaptive capacity	Systems that are both complex and adaptive (capacity to change and learn from experience) are called CAS. The CAS exhibits recursive macro–micro feedback loops with coevolutionary dynamics at the “edge of order and chaos” (Waldrop, 1992), where there is “order for free” or “order from chaos.” CAS models merge complex systems theory with the behavioral theory of the firm and Darwinian principles of evolution (especially variety, selection, novelty, and inheritance) to explain a wide range of phenomena: The firm as a CAS examines strategic dynamics at the firm level (Brown & Eisenhardt, 1997; Burgelman & Grove, 2007); the market as a CAS focuses on competitive dynamics and macro-level economics, whereas the economy is treated as a CAS in evolutionary economics to model dynamic competition and technological innovation (Dopfer et al., 2004).	254
Definition	-	
Thesaurus	Complexity science is presented as an alternative theoretical lens for addressing these issues, and enhancing the potential of SE in a world characterized by fluctuations, irreversibility, nonlinearity, and instabilities	241
	strategic entrepreneurship (SE): exploration–exploitation, opportunity, newness, micro– macro interaction, and dynamics.	241

	“strategic entrepreneurship” produces entrepreneurial action with a strategic perspective and strategic action with an entrepreneurial mindset (Hitt, Ireland, Camp, & Sexton, 2001). SE is defined as “the integration of entrepreneurial (i.e., opportunity-seeking behavior) and strategic (advantage-seeking behavior) perspectives in developing and taking actions designed to create wealth” (Hitt et al., p. 481).	242
	Complexity science offers a theoretical lens for exploring the complex interdependencies of a complex, pluralistic world “in which reversibility and determinism apply only to the limiting, simple cases, while irreversibility and randomness are the rules” (Prigogine & Stengers, 1984, p. 8).	250
Characteristics	SE has been conceptualized as a value-creating union in which a balance is sought between exploration and exploitation (Ireland et al., 2003). March (1991) explains that what is known is thought to be stable and can be exploited through activities such as refinement, efficiency, selection, and implementation; what is unknown is awaiting discovery through exploration activities such as search, variation, experimentation, and discovery	244
	Hitt et al. (2001) suggest that innovation is the middle ground for strategic management and entrepreneurship. In this view the various interfaces between entrepreneurship and strategic management revolve around the firm’s role in innovation activities based on an entrepreneurial mindset (Hitt et al.), its entrepreneurial orientation (Covin & Slevin, 1991), the dominant logic (Meyer & Heppard, 2000), and entrepreneurial resources “defined as the propensity of an individual to behave creatively, act with foresight, use intuition, and be alert to new opportunities” (Mosakowski, 1998).	245
	The assumption is that even minor discontinuities threaten the mainstream organization, and management must create alternative structures (and networks) to discover and exploit them. At the same time, experiments with new venture divisions and various ad hoc structures have produced generally unsatisfactory results, while the evidence suggests that established companies are generally not adroit at developing and successfully implementing radical innovations (Burgelman & Grove, 2007)	247
	SE is also limited by its reliance on a predominantly firm-level perspective. In a recent special issue of Organization Science, the editors argue that innovation is inherently a multilevel phenomenon, and urge researchers to begin treating it as such (Gupta, Tesluk, & Taylor, 2007)	247
Adaptation		
Strategy		
	Another challenge with this new domain is that its boundaries or parameters remain largely unspecified. Hence, literally any existing work in entrepreneurship that includes actions by a firm that are strategic (e.g., building a network, interacting with a venture capital firm, investing in development of an entrepreneurial orientation) can be construed as SE.	243
Strategy development	-	
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	-	
Miscellaneous		
Results	Importantly, SE is not a competitive strategy, a characteristic of a strategy, or a strategic approach selected from a portfolio of strategies. It also differs in important ways from entrepreneurial strategy’s competition-on-the-edge (Eisenhardt et al., 2000) and co-adaptive exploitation of cross-business synergies (Brown & Eisenhardt, 1997), as well as Lavie’s (2006, p. 153) integration of the “inward-looking perspective of the dynamic capabilities literature with the outward-looking technological discontinuities perspective.” It is also not about entrepreneurial actions of individuals (McMullen & Shepherd, 2006) or a creation theory of entrepreneurship (Alvarez & Barney)	267
Criticism / Limits	-	
Other important facts	As such, it becomes less clear whether this hybrid called strategic entrepreneurship is a subfield within the entrepreneurship discipline, a subset of strategic management or corporate entrepreneurship, or a separate domain. In fact, some suggest that SE represents a benign takeover of entrepreneurship by strategic management (Baker & Pollock, 2007).	242
	These theories, all of which are relevant to SE, are grouped into (1) firm-level theories that explain heterogeneity (e.g., the resource-based view, behavioral theory of the firm), (2) meso-level theories linking the firm with its institutional and competitive environment (e.g., transaction cost economics, evolutionary economics), and (3) theories involving interaction between exogenous discontinuities originating in the social, political, and technological environments and change at the institutional environment, industry, and firm levels (e.g., contingency theory, resource dependence theory, population ecology).	248

Feedback plays an important part in cybernetics—to better accomplish communication and control through information processing. It is also a key part of the behavior theory of the firm (Cyert & March, 1963; Simon, 1962). In the simplistic system represented by the Cyert and March model, behavior is driven by the quasiresolution of conflict, uncertainty avoidance, problemistic search, and organizational learning. Rules of thumb and standard operating procedures or “the memory of an organization” serve as stabilizing processes to reduce complexity, guide action, and control behavior. Organizational learning is fragmented, short term in focus, and incremental in nature. 252

McKelvey (2004, p. 330) suggests, “bioevolutionary theory is about equilibrium...evolutionary theory is about what happens after blind variation. Population ecology is about what happens after a species is created, not about its creation. Entrepreneurship is about creating blind variation and before selectionist evolution and population ecology.” 266

Further research investigations

-

Name	Sharma
First Name	Sanjay
Title	Proactive corporate environmental strategy and the development of competitively valuable organizational capabilities
Year	1998
Co-Authors	Vredenburg, Harrie
Type of Article	Research Paper
Published by	John Wiley & Sons, Inc
Initiated by	University
Ref.-ID	4718
Ref.-type	Journal article
Journal	Strategic Management Journal
Volume	19
Issue	8
pages	729-753
Level of examination	Organization
Country of origin	Canada
Subject	Business; Management
Industry sector	Mining and quarrying
Country	Canada
Continent	NA
Ranking	
ISI-Factor	4.464
VHB JQ2	A
Handelsblatt	0.7
Source	BSC
Search term	-

Abstract This article presents the results of a study conducted in two phases within a single industry context. The first phase involved comparative case studies to ground the applicability of the resource-based view of the firm within the domain of environmental responsiveness. The second phase involved testing the relationships observed during the case studies through a mail survey. It was found that strategies of proactive responsiveness to the uncertainties inherent at the interface between the business and ecological issues were associated with the emergence of unique organizational capabilities. These capabilities, in turn, were seen to have implications for firm competitiveness.

Code	Segment	Page
	the applicability of the resource-based view of the firm within the domain of environmental responsiveness.	729
Aim of article	The objective of this article is to examine the validity of the hypothesized linkages between environmental responsiveness strategies and the emergence of competitively valuable organizational capabilities	730
	Firms were picked from each size category (major, senior, intermediate, junior) and from each activity category (integrated, upstream, and downstream)	731

Adaptive capacity

Definition	-	
	valuable organizational capabilities	730
Thesaurus	This study was intended to examine linkages between environmental strategies and the development of capabilities, and understand the nature of any emergent capabilities and their competitive outcomes	730
	Capability for higher-order learning	740
	Capability for continuous innovation	741

Characteristics	-	
Adaptation	-	
Strategy		
	Corporate environmental strategies were examined along 11 dimensions	733
	areas of species habitat preservation at exploration and drill sites, environmental restoration of contaminated soil, risk reduction of environmental	733
	accidents and wastes, and waste reduction/reuse at production and refining sites	733
	material use reduction and conservation, use of alternative fuels, energy conservation, less environmentally damaging products, stakeholder partnerships for environmental preservation, public disclosure, and commitment to research and employee training programs for environmental preservation	733
	Thus, companies were considered proactive only if they exhibited a consistent pattern of environmental practices, across all dimensions relevant to their range of activities, not required to be undertaken in fulfillment of environmental regulations or in response to isomorphic pressures within the industry as standard business practices	733
Strategy development	-	
Climate change strategy	-	
Relevance for decision-making	-	
	One stream of literature has focused on the concept of sustainable development and has attempted to redefine broadly the global societal role of the business corporation (Gladwin, Kennelly, and Krause, 1995; Hart, 1997; Sharma, Vredenburg, and Westley, 1994; Shrivastava, 1995a; Starik and Rands, 1995; Westley and Vredenburg, 1996)	729
	Other writers have cautioned that implementing such a broad redefinition of the role of the corporation may be hazardous for the corporation's financial well-being (Walley and Whitehead, 1994)	729
	Hart and Ahuja (1996), after empirically examining firms' savings from emission reduction, conclude that while here are initial cost savings	729f.
	A third stream of literature has attempted to demonstrate how firms might gain competitive advantage in ways other than waste/efficiency cost savings from environmental strategies. Porter (1991) and Porter and van der Linde (1995)	730
Business relevance	Shrivastava (1995b) and Westley and Vredenburg (1991) show how firms may gain competitive advantage by gaining social legitimization.	730
	Hart (1995) speculates theoretically what might be happening inside Klassen and McLaughlin's 'black box.' He applies the resource-based view of the firm (e.g., Barney and Zajac, 1994) t	730
	These capabilities are more likely to emerge during periods of greater turbulence and organizational change (Wernerfelt, 1984).	730
	his area has found that firm capabilities evolve as a result of firm response to competitive environments (Barnett, Greve, and Park, 1994; Levinthal and Myatt, 1994)	730
	The proactive companies, in contrast, perceived a number of competitive benefits emerging from their environmental response	735
Miscellaneous		
	It was found that strategies of proactive responsiveness to the uncertainties inherent at the interface between the business and ecological issues were associated with the emergence of unique organizational capabilities. These capabilities, in turn, were seen to have implications for firm competitiveness	729
Results	The arguments linking environmental responsiveness to organizational capabilities and performance have been theoretical to date. In the absence of empirical evidence for these relationships, cost-benefit frameworks are dominant and influence corporate managers to adopt only those limited investments in environmental practices which can yield tangible monetary benefits within an economic time frame	730
	Based on the 11 dimensions of environmental response, two companies were classified as proactive and five as reactive	734
	Buffalo Oil, a company considered proactive, has been an industry leader since 1981, in preserving natural habitats, species, and historical heritage sites impacted by its operations. This company made considerable	734

	investments in technologies and management practices to reduce its environmental impact.	
	The other proactive company, Sioux Oil, set up the first North American commercial operation to recycle used engine oil in 1980.	734
	On the other hand, the five companies identified as having reactive environmental strategies emphasized the reduction of risk and liabilities of environmental accidents and spills. Environmental accidents cannot be insured and can cause financial disruption, negative media exposure and damaged reputations for these companies	734
	Hence, the second phase of data collection specifically focused on this issue by explaining the concept of capabilities and asking managers if they perceived any capabilities as having been built up as a result of their environmental responsiveness strategies	735
	An analysis of the interview data indicated three emergent capabilities	735
Criticism / Limits	-	
Other important facts	environmental concerns to a strategic issue for the corporation, managers and management scholars have been debating the role of environmental strategy in the repertoire of strategic management.	729
	The case study is an appropriate method of empirical inquiry when the phenomena to be studied (in this case, corporate environmental responsiveness and organizational capabilities)	731
Further research investigations	-	

		53
Name	Staber	
First Name	Udo	
Title	The competitive advantage of regional clusters: an organizational–evolutionary perspective.	
Year	2007	
Co-Authors	-	
Type of Article	Theoretical Paper	
Published by	Maney Publishing	
Initiated by	University	
Ref.-ID	4723	
Ref.-type	Journal article	
Journal	Competition & Change	
Volume	11	
Issue	1	
pages	3-18	
Level of examination	Organization	
Country of origin	New Zealand	
Subject	Business, Organization	
Industry sector	-	
Country	-	
Continent	-	
Ranking		
ISI-Factor	-	
VHB JQ2	-	
Handelsblatt	-	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND business	
Abstract	<p>Research on the competitiveness of regional clusters of firms in the same and related industries has been dominated by a profoundly optimistic view, concerned far more about the integrative possibilities of dense social networks than the dysfunctional consequences of such networks. I argue that this approach, which draws selectively on the transaction cost, knowledge-based and institutionalist perspectives, is one-sided in its fundamental premises, focusing on the presumed benefits of network homogeneity and coherence. It has led researchers to pay insufficient attention to the role of variations and imperfections in copying routines and competencies as a basis of cluster competitiveness. The evolutionary perspective calls into question the common view that competitive cluster network structures develop towards coherence and homogeneity. It views the cluster as a multilevel organizational system whose development is strongly influenced by variation generating processes at the micro-level. I discuss these processes, with special reference to competitive advantage, and outline some of the challenges they imply for empirical research.</p>	
Code	Segment	page
Aim of article	<p>Research on the competitiveness of regional clusters of firms in the same and related industries has been dominated by a profoundly optimistic view, concerned far more about the integrative possibilities of dense social networks than the dysfunctional consequences of such networks. I argue that this approach, which draws selectively on the transaction cost, knowledge-based and institutionalist perspectives, is one-sided in its fundamental premises, focusing on the presumed benefits of network homogeneity and coherence</p>	3
	<p>In this article, I take an evolutionary approach to the conventional argument that cluster competitiveness depends on high levels of organizational integration, sustained by coherent network structures and homogenizing network competencies.</p>	4
Adaptive capacity		
	<p>Conditions then are optimal for exploring novel connections and associations, thus improving the network's adaptive capacity (Cohen & Levinthal 1990).</p>	7
Definition	-	7

	The evolutionary perspective views competitive advantage not as an optimal end state but a dynamic process of continuous learning and adjustment in volatile environments, which is the setting in which clusters are hypothesized to prosper	7
	In contrast to the adaptation focus of the transaction cost, knowledge-based and institutionalist approaches, the evolutionary logic emphasizes adaptability, that is, the ability to cope with uncertainty and unpredictable variations (Parsons 1964).	7
Characteristics	-	
Adaptation	-	
Strategy		
Strategy development	-	
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	-	
Miscellaneous		
Results	I suggest that the competitive advantage of a cluster lies more in the ability to generate new variations, in the long term and in an uncertain environment. In evolutionary terms, the challenge in volatile environments is to create cluster networks that broaden the range of visions, permit competing approaches, enrich the pool of competencies	4
Criticism / Limits	-	
Other important facts	This profoundly optimistic view of cluster networks is problematic, both for theoretical and empirical reasons. The theoretical framework commonly used by researchers is biased in favor of viewing networks as producing mostly positive and intended outcomes, such as easy knowledge transfer and minimal transaction costs.	4
Further research investigations	-	

		54
Name	Sussmann	
First Name	Carl	
Title	Building adaptive capacity: the quest for improved organizational performance	
Year	2004	
Co-Authors	-	
Type of Article	Research Paper	
Published by	Sussmann Associates	
Initiated by	Management Consulting Services	
Ref.-ID	4670	
Ref.-type	Journal article	
Journal	The Nonprofit Quarterly (partly)	
Volume	-	
Issue	-	
pages	1-18	
Level of examination	Organization	
Country of origin	USA	
Subject	Business, Non-profit, Organization	
Industry sector	-	
Country	-	
Continent	-	
Ranking		
ISI-Factor	-	
VHB JQ2	-	
Handelsblatt	-	
Source	Google Scholar	
Search term	Searched within reference list	
Abstract	This paper was prepared for Management Consulting Services (MCS), a Boston-based management support organization, with the generous support of the Barr Foundation. The foundation made the grant to stimulate research and thinking about adaptive capacity among practitioners in the nonprofit sector and to better understand how adaptive capacity contributes to organizational effectiveness. MCS retained Carl Sussman, the principal of Sussman Associates, a management and community development consulting practice, to lead the research effort. This paper is his effort to define adaptive capacity and to construct a framework for thinking about organizational effectiveness that reflects ascendant management and organizational development theories and paradigms that emphasize change, complexity, and systems thinking.	
Code	Segment	page
Aim of article	-	
Adaptive capacity		
	Nonprofit management practitioners have begun to recognize that an organization's ability to challenge its own established ways of thinking and doing things and to successively craft and adopt more effective means is a distinct form of performance-enhancing organizational capacity: Adaptive capacity.	3
Definition	Through adaptive capacity the ability to advance the organization's mission by strategically changing in anticipation of and in response to changed circumstances and in pursuit of enhanced results.	3
	Programmatic capacity is an organization's ability to carryout its primary value-creating charitable activities	4
	Programmatic capacity enables an organization to create more value because it has more experienced staff or a better service delivery model than its competitors	4
	Organizational capacity refers to those attributes – structures, functions, systems, procedures and culture – that promote order and predictability, thereby helping to maintain the collective effort and the corporate entity	4

Similarly, mechanisms that allow organizations to handle leadership succession and personnel transitions are manifestations of organizational capacity, creating operational continuity	4
In other words, organizational capacity endows organizations with a measure of stability and endurance	4
Organizations that possess adaptive capacity are very focused on and responsive to what is happening outside their organizational boundaries	5
They consciously interact with their environments which, in turn, provide informationrich feedback, stimulate learning, and ultimately prompt improved performance	5
Adaptive capacity pulls an organization in the chaotic direction while organizational capacity pulls it toward stability	8
Being adaptive requires a very developed awareness of how interdependent the organization is with its environment.	10

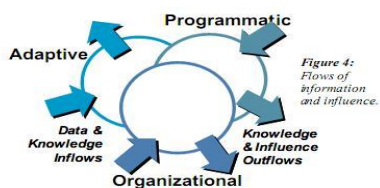


Figure 4: Flows of information and influence.

	11
Active information-seeking and processing reflects adaptive behavior	11
Information and influence flows can be depicted in capacity diagrams with arrows that enter and emanate from any of the three capacity spheres. For instance, arrows entering the organizational capacity circle might reflect the organization’s consumption of information about its donors’ or volunteers’ concerns, motivation and satisfaction. This data can be used to strengthen the organization’s resource base. Arrows emanating from that circle might reflect the effect of its communications strategy in influencing donor behavior	11
Being effective, therefore, means having the capacity to transcend organizational boundaries. These connections take two predominant forms: value chains and networks.	12
Others experience turbulence as a challenge, a golden opportunity to rethink what they do and how they do it. Moreover, the process itself helps them realize that their comfort with ferment may actually be a long-term asset, making them stronger, more resilient and higher performing.	14
Characteristics	
though in this case the following four qualities capture the essence of adaptive organizations: 1. external focus, 2.network connectedness, 3. inquisitiveness, and 4. innovation.	14
Building adaptive capacity is hard work; it shakes things up and it takes resources	14
1. External Focus We generally view capacity building as something that happens internally, involving the reengineering of core organizational processes. But to be adaptive and to further strengthen programs, organizations need to be acutely focused on the dynamism and complexity that exist in their operating environments.	14
They look not only to adapt nimbly to their environments but also, when possible, to adapt their environments to them	15
So being adaptive means resisting the natural tendency to become organizationally introverted by incessantly pushing the organization to be outwardly directed.	15
Network Connectedness Organizational performance--the “ability to allocate resources, innovate, adapt, and solve problems, both routine and radical--is related to ... organizational architecture.” ¹	16
3. Inquisitiveness An emphasis on organizational learning meanders through educational, organizational development and management literature starting with John Dewey and continuing with Kurt Lewin, Douglas McGregor, Chris Argyris and Donald Schon	18
They are inquisitive in that they seek out data and information; they use it to learn, and then they apply and share their newfound knowledge	18
Organizations that have developed this appetite for inquiry are able to initiate change to improve performance and to embrace it in response to new circumstances	18
the appetite for being better informed and applying knowledge to advance the organization’s core business--must be evident in the organizational culture, not just its structures and processes	18
4. Innovation The term adaptive capacity refers to an organization’s ability to change:	18
in response to changed circumstances--survival--and • in pursuit of enhanced results--creation	19

	Innovation is an important characteristic of adaptive capacity both because it suggests the generative process of creating something new or different and because it entails the critical complementary facility of challenging accepted wisdom	19
	Organizations can create conditions that promote innovation, including: committing staff time and financial resources to thoughtful experimentation, being sure to reward both the successes and the failures; promoting organizational diversity; articulating new challenges that force the staff to collaborate with others and stretch their thinking; and seeding the organizational environment with new ideas and influences.	19
Adaptation	“Adaptive systems will always exhibit a kind of dynamic tension between chaos and order	8
	“the capacity to co-evolve in an ecological sense with their external environments through mutual interaction, internal adaptability, and rapid response.	13
Strategy		
Strategy development	With the most obvious exception of strategic planning services, much of the training and consultation in the nonprofit management assistance field involve organizational capacity-building	4
	While organizational capacity serves the strategic purpose of stabilizing organizations and creating order, adaptive capacity involves the complementary and often destabilizing quest for change in pursuit of improved performance, relevance and impact.	5
	A growing body of management literature suggests a strategy for achieving some operating equilibrium between these seeming contradictory pulls: The answer can be found in the concept of capacity alignment, in the region of our Venn diagram where organizational and adaptive capacities overlap	8
	Outsourcing, specialization, building value chains and collaborations, can all be strategies for leveraging systemic capacity through interdependence	14
	Inquisitiveness, for example, refers to well established ideas about learning and knowledge management, concepts many nonprofit organizations espouse	14
	organizational culture--the gestalt of structures, procedures, processes and everyday actions that mold organizational behavior	14
Climate change strategy	-	
Relevance for decision-making	-	
Business Relevance	Capacity Alignment – The degree of overlap between the three circles captures another characteristic of capacity: the extent to which an organization’s capacities work together, contributing to organizational effectiveness by reinforcing each other to advance mission	7
	“The successful organization must work hard to create a strong environment and culture within which people can effectively feel freedom, stability, and loyalty in the face of a dynamic, uncertain, and complex external environment	8
	These elements of an organization’s core identity provide a structure around which stakeholders can operate with independence and a minimum of formal structure to pursue improve performance.	8
	While it is not always obvious, every organization is highly interdependent with its environment. Indeed all aspects of organizational life are influenced, often profoundly, by its environment. Some of these influences are obvious: The recent recession rippled through the nonprofit sector as state governments cut spending and contracts. Shrinking foundation investment portfolios translated into sharply reduced grantmaking. Even individual donors, faced with declining income, reduced their charitable-giving	10
	Organizational performance and capacity depends not only on what happens in the organization; it also depends on what is going on outside it and, therefore, on how organizations construct their relationship to the world around them to produce results.	10
Miscellaneous		
Results	However, they do need to accrue the organizational, programmatic and adaptive capacities to meet the challenges they face as they grow and mature and to build these capacities in relation to each other. In other words, organizations should seek to maintain a judicious balance between their level of capacity to create social value, secure organizational stability, and adapt to their complex and changing environments	7
	Adaptive organizations are capable of learning from their environment to improve their performance	11
	Networking is thus another important adaptive strategy for extending capacity	14
	At first blush, however, adaptive capacity throws a wrench into this machinery, because instead of the imagery of sturdy, predictable, well-ordered, self-contained and wellbehaved organizations, adaptive capacity advances the virtues of an unruly extrovert on a heart-stopping rollercoaster ride in pursuit of change and flux	20

	Like other capacity building efforts, adaptive capacity is not a summit that can be conquered and a flag planted. It is something organizations pursue in an ongoing manner through measures that embed the four attributes of adaptive capacity--external focus, network connectedness, inquisitiveness and innovation--inextricably in the corporate culture.	20
Criticism / Limits	-	
Other important facts	-	
Further research investigations	-	

		55
Name	Tan	
First Name	Justin	
Title	A stage-dependent model of resource utilization, strategic flexibility, and implications for performance over time: empirical evidence from a transitional environment	
Year	2009	
Co-Authors	Zeng, Yong	
Type of Article	Research Paper	
Published by	Springer Science & Business Media B.V	
Initiated by	University	
Ref.-ID	4617	
Ref.-type	Journal article	
Journal	Asia Pacific Journal of Management	
Volume	26	
Issue	3	
pages	563-588	
Level of examination	Organization	
Country of origin	Canada	
Subject	Management	
Industry sector	State owned enterprises (Construction)	
Country	China	
Continent	Asia	
Ranking		
ISI-Factor	1.129	
VHB JQ2	D	
Handelsblatt	0.3	
Source	BSC	
Search term	"adaptive capacity" AND environment* change AND strategy AND business	
Abstract	<p>It has long been recognized that there is a tradeoff between exploration and exploitation. How organizations utilize resources across time and space will affect firm survival and growth. In this paper, we examine resource utilization and performance implications over time in an environment undergoing fundamental institutional transformation. Based on a large archive of Chinese government data from 1988, 1992, and 1996, the study finds that (1) the impact of resource utilization is contingent on the degree to which different resources are committed to factors of production, (2) the impact is curvilinear and only valid within an "optimal" range, and (3) the performance implications change over time. As firms enter later stages of the transitional process, efficiency becomes less important as they shift their strategic focus from exploitation to exploration, which requires more flexibility. These findings have significant bearing on the issue of upgrading technological competitiveness in China as the country becomes increasingly integrated in the global economy. Such insights may also have implications for other emerging economies in Asia.</p>	
Code	Segment	page
Aim of article	In this paper, we examine resource utilization and performance implications over time in an environment undergoing fundamental institutional transformation. Based on a large archive of Chinese government data from 1988, 1992, and 1996, the study finds that (1) the impact of resource utilization is contingent on the degree to which different resources are committed to factors of production, (2) the impact is curvilinear and only valid within an "optimal" range, and (3) the performance implications change over time	563
Adaptive capacity		
	Firms in rapidly changing environments cannot remain static over time. They have to build and maintain an adaptive capacity and develop new competitive advantages at different stages of the institutional transition in order to "co-evolve" with the environmental changes.	581
Definition	-	

	How firms configure and utilize resources has become a key organizational capability (Dutta, Narasimhan, & Rajiv, 2005). Managers must choose between organization designs suited to routine, repetitive tasks and designs suited to nonroutine, innovative tasks. Overly specialized organizations may be trapped in sub-optimal solutions, soon to be superseded by more innovative firms (Schumpeter, 1975), especially in environments undergoing rapid transition and escalating competition (Volberda, 1996).	564
Thesaurus	One side of this debate typically argues that flexibility buffers a firm's technical core from environmental fluctuations, and, thus, has a performance-enhancing effect (Cyert & March, 1963; Pfeffer & Salancik, 1978; Thompson, 1967)	564
	For strategy researchers, the term "flexibility" has widely been used to denote firm capability to respond to environmental demands (Sanchez, 1995). Strategy researchers such as Ghemawat and Costa (1993) argue that firms must maintain a balance between a strategy of dynamic effectiveness through flexibility and static efficiency through more rigid discipline.	566
	defines strategic flexibility as the ability of firms to "reposition themselves in a market, change their game plans, or dismantle their current strategies" (1985: 1).	566
Characteristics	Much organization theory argues that exploitation requires efficiency, that efficiency requires bureaucracy, that bureaucracy impedes flexibility, which is a prerequisite for exploration, and that organizations therefore confront a tradeoff between efficiency and flexibility (Adler & Borys, 1996; Adler, Goldoftas, & Levine, 1999)	565
	Selecting and adjusting the level of resource utilization along the equilibrium line is one tool to manipulate the firm's capability to be responsive to environmental changes and to reestablish a proper alignment with the changing environment. The level of resource utilization is of particular interest for strategic adaptations because of its impact on exploitation and exploration.	566
	Exploration includes organizational characteristics such as risk taking, experimentation, flexibility, discovery, and innovation, whereas exploitation includes characteristics such as refinement, efficiency, implementation, and execution.	566
	Both economists and business strategy researchers see a close link between flexibility and uncertainty. The greater the uncertainty, the more there is to be learned about the future and the more valuable it is to keep options open (Ghemawat, 1991).	567
	We highlight the positive role of flexibility on firm performance because it raises the firm's sensitivity and adaptability to environmental changes, and it facilitates organizational exploration.	568
Adaptation	Furthermore, firms shift their priority between exploitation and exploration when they make the transition between strategic adaptations in stable versus turbule environment.	570
	To accommodate the strategic adaptation under the rapidly changing environment, firms must develop dynamic capabilities, including accumulating distinctive resources, allocating these resources, and adjusting their deployment over time (Luo, 2000).	572
	As D'Aveni (1994) and Porter (1985) point out, firms with a moderate level of flexibility are able to pursue an exploration strategy, adapt to unanticipated situations, and fight back. Firms whose strategic intent is to maximize the exploitation of existing opportunities should focus more on improving resource utilization	584
Strategy		
	Balancing the need for exploration and exploitation is a major strategic dilemma because these two lines of pursuit compete for scarce resources. Exploration requires flexibility, whereas exploitation requires efficiency. How organizations utilize resources thus has a significant impact on strategy and performance	564
	From an organizational point of view, efficiency requires a bureaucratic form of organization with high levels of standardization, formalization, and specialization. However, such bureaucratic features impede the fluid process of mutual adjustment required for the flexibility that is essential for strategic adaptability to environmental changes (Adler et al., 1999).	566
	Although efficient organizations maintain a competitive advantage by exploiting a stable environment and becoming specialists, surviving in a more turbulent and rapidly changing environment requires that firms become generalists and explore new ways to develop strategic competencies. Such an adaptive process implies that the balance between exploitation and exploration (and the requirement for flexibility and efficiency) may be dependent on the stage of evolution of the organization, i.e., it is stage-dependent.	570
Strategy development	because at different times and space, firms face different environmental characteristics and, as a result, have to adjust their strategic priorities between exploitation and exploration	564
Climate change strategy	-	
Relevance for decision-making	-	

Business relevance	In order to respond to environmental turbulence and to reestablish an alignment with the rapidly changing environment, firms have used surplus resources (and capacities) strategically to gain flexibility	572
Miscellaneous		
	On the other hand, resources not fully committed to the factors of production exhibited a positive impact on performance, thus lending evidence to support the predicted relationship (Hypothesis 1b) that resource flexibility improves a firm's capability to quickly adapt to environmental changes and to realign with the environment.	579
	In summary, the study finds evidence to show that within a certain range, efficiency and flexibility can be sources of competitive advantage, which enhances the firm strategic position; beyond the critical point, they become a value-destroying force.	580
	However, given the tradeoff between the costs and benefits of flexibility, the benefits outweigh the costs. In sum, under-utilized resources and capacities help a firm maintain a certain level of strategic flexibility and overcome a "complexity catastrophe" (Kauffman, 1995).	580
Results	This study shows that in order for organizational resources to have performance-enhancing effects, they need to be liquid resources that are readily available to offer managerial discretion and consequently strategic flexibility.	581
	Second, the impact of organizational resources is contingent on the stages of the organizational evolution, as March claims (1991).	581
	Likewise, firms in different industries and pursuing different strategies need different resources and capacities. The bundle of resources inherited from the command economies, which have helped SOEs to survive the reform so far, may be profoundly different from those resources needed to compete in the new competitive landscape	582
	Rather than being a passive product of initial conditions, however, firms learn from the environment and "enact their own environments" (Levinthal & March, 1993: 99) by adjusting resource allocation and utilization. Such a co-evolutionary perspective thus assumes that organizational transformation is not an outcome of managerial adaptation or environmental selection alone but rather the interaction of macro-level environmental effects created by reform measures and firm-level strategic adaptations (Carney & Gedajvic, 2002; Lewin & Volberda, 1999; Tan & Tan, 2005)	583
Criticism / Limits	-	
Other important facts	It has long been recognized that there is a tradeoff between exploration and exploitation. How organizations utilize resources across time and space will affect firm survival and growth.	563
	This implies that future resources will reflect a pattern of integration and reconfiguration similar to that of historical resources (Adner & Helfet, 2003). Such dynamic learning and adaptation is essential to the evolutionary development of sustainable advantages and to creating new bundles of capabilities (Luo, 2000).	580
Further research investigations	-	

Name	Varga
First Name	Liz
Title	A case-study of the three largest aerospace manufacturing organizations: an exploration of organizational strategy, innovation and evolution
Year	2006
Co-Authors	Allen, Peter M.
Type of Article	Research Paper
Published by	Institute for the Study of Coherence & Emergence
Initiated by	University
Ref.-ID	4674
Ref.-type	Journal article
Journal	Emergence: Complexity & Organization
Volume	8
Issue	2
pages	48-64
Level of examination	Industry
Country of origin	UK
Subject	Management, Organization, Strategy
Industry sector	Manufacturing
Country	United States / Europe
Continent	NA/ Europe
Ranking	
ISI-Factor	-
VHB JQ2	-
Handelsblatt	-
Source	BSC
Search term	"adaptive capacity" AND environment* change AND strategy AND business
Abstract	<p>Many of the most successful firms have placed a strong emphasis on strategy. Strategies help decision-makers in organizations to think through what the organization needs to achieve and how these needs may be satisfied. This case study considers what the CEO of the top three aerospace manufacturers say about their strategies and how these strategies are being implemented. The aerospace manufacturing industry is interesting from a number of respects: its dependence on innovation, its global nature, its relationships with government and other firms, and the different characteristics of the civil and defence markets. This aerospace manufacturing triad is also interesting because of its industry sector coverage: one is a largely defence aerospace manufacturer, the second a largely comm. aerospace manufacturer and the third, an aerospace manufacturer with a balanced portfolio. Strategies are shifting to take an holistic view of the firm as the firm is increasingly being recognized as a CS. This holism is particularly evident in the manufacture firms examined, as they balance innovation, strategy and organization characteristics in an evolutionary manner. Innovation is fundamental to evolution and this case study employs a novel holistic approach to innovation portfolio assessment. A CS perspective is taken for organizational analysis allowing the examination of how fluctuations, resource richness, freedom, capacity to innovate, culture, technology and strategy are balanced and made synergistic. This case study reflects upon how these organizations' strategies are reflected in their organization forms, their investments in innovations, their performance and ultimately in their potential to evolve.</p>

Code	Segment	page
Aim of article		
Adaptive capacity		
Definition	-	
Thesaurus	-	
Characteristics	-	
Adaptation	-	
Strategy		

	Many of the most successful firms have placed a strong emphasis on strategy. Strategies help decision-makers in organizations to think through what the organization needs to achieve and how these needs may be satisfied.	1
	Strategies are shifting to take an holistic view of the firm as the firm is increasingly being recognized as a complex system.	1
Strategy development	the creation of strategies and acting strategically places a focus on the long term, and the things that are essential for evolution.	1
	Strategic direction requires attention to environments and reconfiguration of organizational architecture to fit anticipated adaptation of agents.	1
	However, strategies need to be adaptable to changing circumstances. Exploration is fundamental to adaptation and complexity science provides a theoretical basis for empirical findings, in particular, archetypal patterns of strategy, structure and environment (Maguire, 1999).	1
	Strategy and strategic change itself are influenced by the extent to which leaders believe that it is driven by content (that is structure) and by process	1
	The Strategy-Structure-Performance school, concerned with scale, scope and form of organizations; The Structure-Content-Performance school concerned with position and market power, and;Resource-Based View and core competencies.	1
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	manufacturing firms examined, as they balance innovation, strategy and organizational characteristics in an evolutionary manner.	1
Miscellaneous		
Results	-	
Criticism / Limits	-	
Other important facts	-	
Further research investigations	-	

Name	Volberda
First Name	Henk W.
Title	Building flexible organizations for fast-moving markets
Year	1997
Co-Authors	-
Type of Article	Research Paper
Published by	Elsevier Science Publishing Company, Inc
Initiated by	University
Ref.-ID	4690
Ref.-type	Journal article
Journal	Long range planning
Volume	30
Issue	2
pages	169-183
Level of examination	Organization
Country of origin	Netherlands
Subject	Management, Business, Planning& Development
Industry sector	Cross-sector
Country	Netherlands
Continent	Europe
Ranking	
ISI-Factor	1.58
VHB JQ2	B
Handelsblatt	0.5
Source	Google Scholar
Search term	strategic management AND "adaptive capacity"
Abstract	By considering flexibility as a valuable strategic option in turbulent environments, this article distinguishes four types of effective response to strategic change. From this typology different trajectories of revitalization are derived. On the basis of this typology, the article describes a method for diagnosing organizational flexibility and guiding the transition process, the Flexibility Audit & Redesign (FAR) method. This method was applied successfully within the Dutch Postbank NV, Philips Semiconductors and the Dutch National Gas Corporation. The findings suggest that a viable corporation has to oscillate between 'planned' and 'flexible' forms. In this process of change, the corporation has to prevent itself from overshooting and becoming extremely rigid or chaotic.

Code	Segment	page												
Aim of article	-													
Adaptive capacity														
Definition	Structural flexibility or adaptive manoeuvring capacity refers to the capacity of the management to adapt its decision and communication processes within a given structure as well as the rapidity by which this can be accomplished.	3												
Thesaurus	Organizational flexibility is considered as a strategic option in situations in which anticipation is impossible and strategic surprise likely.	2												
Characteristics	<p>A better alternative to achieve control is the flexibility option which requires high responsiveness (control-ability) of the organization and sufficient managerial capabilities (control capability of management).</p> <table border="1"> <thead> <tr> <th>Adaptive</th> <th>Internal structural flexibility</th> <th>External structural flexibility</th> </tr> </thead> <tbody> <tr> <td></td> <td>Creating multifunctional teams</td> <td>Purchasing components from suppliers with a short delivery time (JIT)</td> </tr> <tr> <td></td> <td>Changing managerial roles</td> <td>Purchasing subassemblies from suppliers (co-makership)</td> </tr> <tr> <td></td> <td>Alterations in control systems</td> <td>Developing subcomponents together with suppliers (co-design)</td> </tr> </tbody> </table>	Adaptive	Internal structural flexibility	External structural flexibility		Creating multifunctional teams	Purchasing components from suppliers with a short delivery time (JIT)		Changing managerial roles	Purchasing subassemblies from suppliers (co-makership)		Alterations in control systems	Developing subcomponents together with suppliers (co-design)	3
Adaptive	Internal structural flexibility	External structural flexibility												
	Creating multifunctional teams	Purchasing components from suppliers with a short delivery time (JIT)												
	Changing managerial roles	Purchasing subassemblies from suppliers (co-makership)												
	Alterations in control systems	Developing subcomponents together with suppliers (co-design)												
Adaptation	-													
Strategy														

	Notwithstanding these provocative questions, most of the literature in strategic management is still rooted in stability, not change.	1
	Therefore, some researchers in strategic management considered organizational flexibility as a strategic option.	1
Strategy development	-	
Climate change strategy	-	
Relevance for decision-making	-	
Business relevance	The basic effect of uncertainty is that it limits the ability of the organization to pre-plan or make decisions about activities in advance of their execution.	1
Miscellaneous		
Results	-	
Criticism / Limits	-	
Other important facts	-	
Further research investigations	-	

Name	Wang
First Name	Catherine L.
Title	Dynamic capabilities: a review and research agenda
Year	2007
Co-Authors	Ahmed, Pervaiz K.
Type of Article	Research Paper
Published by	Wiley-Blackwell
Initiated by	University
Ref.-ID	4696
Ref.-type	Journal article
Journal	International Journal of Management Reviews
Volume	9
Issue	1
pages	31-51
Level of examination	Organization
Country of origin	UK
Subject	Business; Management
Industry sector	Cross-sector
Country	n. A.
Continent	n. A.
Ranking	
ISI-Factor	2.286
VHB JQ2	-
Handelsblatt	0.3
Source	BSC
Search term	"adaptive capacity" AND environment* change AND strategy AND business
Abstract	The notion of dynamic capabilities complements the premise of the resource-based view of the firm, and has injected new vigour into empirical research in the last decade. Nonetheless, several issues surrounding its conceptualization remain ambivalent. In light of empirical advancement, this paper aims to clarify the concept of dynamic capabilities, and then identify three component factors which reflect the common features of dynamic capabilities across firms and which may be adopted and further developed into a measurement construct in future research. Further, a research model is developed encompassing antecedents and consequences of dynamic capabilities in an integrated framework. Suggestions for future research and managerial implications are also discussed.

Code	Segment	page
	in light of empirical advancement, this paper aims to clarify the concept of dynamic capabilities, and then identify three component factors which reflect the common features of dynamic capabilities across firms and which may be adopted and further developed into a measurement construct in future research	31
Aim of article	The objectives of this paper are: (i) to evaluate the theoretical and empirical development of dynamic capabilities in order to identify the issues that remain to be resolved	32
	(iii) to propose a research model incorporating antecedents and consequences of dynamic capabilities	32
	What are the relationships between dynamic capabilities and other organizational variables, particularly firm strategy and firm performance? This paper aims to answer these questions below.	35

Adaptive capacity

Definition	-
	This is captured in the notion of dynamic capabilities (Eisenhardt and Martin 2000; Teece et al. 1992, 1997)
Thesaurus	Dynamic capabilities encapsulate wisdom from earlier work on distinctive competence (Learned et al. 1969; Selznick 1957), organizational routine (Nelson and Winter 1982), architectural knowledge (Henderson and Clark 1990), core competence (Prahalad and Hamel 1990), core capability and rigidity (Leonard-Barton 1992), combinative capability (Kogut and Zander 1992) and architectural competence (Henderson and Cockburn 1994).

	Penrose (1959) provided initial insights into the resource perspective of the firm	32
	However, 'the resource-based view of the firm' (RBV) was put forward by Wernerfelt (1984) and subsequently popularized by Barney (1991)	32
	RBV mainly adopts and paraphrases Barney's (1991, 101) statements: firm resources are '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'	33
	Teece et al. (1997, 515) define capabilities as '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'	33
	This is hardly different from their definition of dynamic capabilities: 'the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments'	33
	while Rindova and Kotha (2001), through their empirical research, identify dynamic capabilities as emergent and evolving.	33
	Second, the RBV has been criticized for being static, and sustained competitive advantage has been seen as unlikely in dynamic markets (D'Aveni 1994; Eisenhardt and Martin 2000).	33
	Hence, the RBV fails to address the influence of market dynamism and firm evolution over time.	33
	We define dynamic capabilities as a firm's behavioural orientation constantly to integrate, reconfigure, renew and recreate its resources and capabilities and, most importantly, upgrade and reconstruct its core capabilities in response to the changing environment to attain and sustain competitive advantage	35
	we identify three main component factors of dynamic capabilities, namely adaptive capability, absorptive capability and innovative capability	36
	Adaptive capability is defined as a firm's ability to identify and capitalize on emerging market opportunities (Chakravarthy 1982; Hooley et al. 1992; Miles and Snow 1978). Chakravarthy (1982) distinguishes adaptive capability from adaptation. The latter describes an optimal end state of survival for a firm, while adaptive capability focuses more on effective search and balancing exploration and exploitation strategies (Staber and Sydow 2002).	37
Characteristics	Cohen and Levinthal (1990, 128) refer to absorptive capacity: 'the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends ... the ability to evaluate and utilize outside knowledge is largely a function of the level of prior knowledge'	37
	Innovative capability refers to a firm's ability to develop new products and/or markets, through aligning strategic innovative orientation with innovative behaviours and processes (Wang and Ahmed 2004). As indicated in the definition, innovative capability encompasses several dimensions.	38
Adaptation	-	
Strategy		
	to what extent does the concept of dynamic capabilities complement the original propositions of the RBV?'	33
Strategy development	Thus, we contend that dynamic capabilities are the 'ultimate' organizational capabilities that are conducive to long-term performance, rather than simply a 'subset' of the capabilities, as Teece et al. (1997) suggest	36
	However, the effects of dynamic capabilities on capability development and firm performance are relatively complex: a firm strengthens particular capabilities as directed by its own strategic goals; and when capability development and firm strategy are effectively aligned, a firm's dynamic capabilities lead to better performance and hence sustained competitive advantage	43
Climate Change Strategy		
Relevance for Decision-making		
Business relevance	Since the 1990s, relentless competition has driven firms constantly to adapt, renew, reconfigure and recreate their resources and capabilities in line with the competitive environment	31
Miscellaneous		
Results	Empirical studies also reveal other processes pertinent to dynamic capabilities, such as the internal and external integration of knowledge in a healthcare firm (Petroni 1998), dynamic learning in telecommunication firms (Majumdar 1999), capability possession, deployment and upgrading in international expansion (Luo 2000), technology accumulation in cross-border transactions of biotech firms (Madhok and Osegowitsch 2000)	34
	In summary, the emergence of dynamic capabilities has enhanced the RBV by addressing the evolutionary nature of firm resources and capabilities in relation to environmental changes and enabling identification of	35

	firm- or industry-specific processes that are critical to firm evolution	
	We articulated the differences in resources, capabilities, core capabilities and dynamic capabilities in a 'hierarchical' order and positioned dynamic capabilities in the third order of the hierarchy.	43
	The essence of dynamic capabilities is a firm's behavioural orientation in the adaptation, renewal, reconfiguration and re-creation of resources, capabilities and core capabilities responding to external changes.	43
	market dynamism as an antecedent	43
	Effective capability development requires that firms maintain a consistent long-term vision and have long-term performance at heart	44
Other important facts	Third, the RBV has been attacked for its failure to define mechanisms that explain how resources are transformed to competitive advantage (Mosakowski and McKelvey 1997; Priem and Butler 2001a,b;)	34
	However, such research findings primarily reveal firm- or industry-specific processes, and no existing studies have summarized the commonalities of dynamic capabilities across firms	35
Future research investigations	Future research should continue such qualitative endeavours, but efforts should be made toward establishing linkages between firm-specific processes and the commonalities of dynamic capabilities across firms which we identified in this study	43

59	
Name	Wedawatta
First Name	Gayan
Title	Building up resilience of construction sector sme's and their supply chains to extreme weather events
Year	2010
Co-Authors	Ingirige, Bingunath; Amaratunga, Dilanthi
Type of Article	Theoretical Paper
Published by	Vilnius Gediminas Tech Univ
Initiated by	University
Ref.-ID	4673
Ref.-type	Journal article
Journal	International Journal of Strategic Property Management
Volume	14
Issue	4
pages	362-375
Level of examination	Companies
Country of origin	UK
Subject	Business, Environmental Science
Industry sector	Construction
Country	UK
Continent	Europe
Ranking	
ISI-Factor	-
VHB JQ2	-
Handelsblatt	-
Source	BSC
Search term	"adaptive capacity" AND climat* change AND strategy AND compan*
Abstract	<p>Wider scientific community now accept that the threat of climate change as real and thus acknowledge the importance of implementing adaptation measures in a global context. In the UK, the physical effects of climate change are likely to be directly felt in the form of extreme weather events, which are predicted to escalate in number and severity in future under the changing climatic conditions. Construction industry; which consists of supply chains running across various other industries, economies and regions, will also be affected due to these events. Thus, it is important that the construction organisations are well prepared to withstand the effects of extreme weather events not only directly affecting their organisations but also affecting their supply chains which in turn might affect the organisation concerned. Given the fact that more than 99% of construction sector businesses are SMEs, the area can benefit significantly from policy making to improve SME resilience and coping capacity. This paper presents the literature review and synthesis of a doctoral research study undertaken to address the issue of extreme weather resilience of construction sector SMEs and their supply chains. The main contribution of the paper to both academia and practitioners is a synthesis model that conceptualises the factors that enhances resilience of SMEs and their supply chains against extreme weather events. This synthesis model forms the basis of a decision making framework that will enable SMEs to both reduce their vulnerability and enhance their coping capacity against extreme weather.</p>

Code	Segment	page
Aim of article	the research aims to address this requirement by developing a decision making framework that can be used by construction sMes to improve their resilience against ewes.	365
Adaptive capacity		
Definition	resilience, in an organisational context, "as a function of an organisation's situation awareness, management of keystone vulnerabilities, and adaptive capacity in a complex, dynamic and interconnected environment"	368
Thesaurus	improving the resilience of sMes to the effects of ewes has thus become an important issue, with the increasing threat of ewes.	363
	as far as sMes are concerned, being resilient might well decide the survival or the failure of an sMe affected, creating economic and social consequences	363

	hence, improving the resilience of sMes and their supply chains to ewes has become an important issue given the ever increasing threat of such events.	363
	supply chains face disruptions of various sorts	367
	McManus et al. (2007) identify resilience, in an organisational context, “as a function of an organisation’s situation awareness, management of keystone vulnerabilities, and adaptive capacity in a complex, dynamic and interconnected environment”.	368
	in this research, resilience is seen as a accumulation of vulnerability, coping capacity and coping strategies, in an organisational context.	369
	coping capacity, in this research, is defined as “the ability of people or organisations to limit adverse consequences of ewes, using available resources and capabilities”	369
Characteristics	as linnenluecke and Griffiths (2010) point out, businesses have to go through a learning curve, which will enable them to learn from unique weather extremes that would improve their resilience to a future weather extreme.	365
	this framework too has identified a range of resilience indicators and is suggested to be used for comparative assessments of disaster resilience at the local or community level	368
	situation awareness – roles and responsibilities, understanding of hazards and consequences, connectivity awareness, insurance awareness, recovery priorities Management of keystone vulnerabilities – planning strategies, participation in exercises, capability and capacity of internal and external resources, organisational connectivity adaptive capacity – silo mentality, communications and relationships, strategic vision and outcome expectancy, information and knowledge, leadership, management and government structure	369
Adaptation	-	
Strategy		
Strategy development	it is therefore necessary for business organizations to consider the wider impacts of ewes that can affect their businesses and their supply chains, not only the direct physical impacts.	368
Climate Change Strategy	coping strategies are defined as “actions that increase the ability to prevent, tolerate and/or recover from impacts” in this research.	370
Relevance for Decision-making	therefore, reducing vulnerability, improving coping capacity and implementing coping strategies	369
	the decision making framework to be developed will be focused around these three key issues of concern	369
Business relevance	Being a resilient business will not only allow construction sMes to prevent, withstand, recover and learn from ewes (i.e. minimise negative consequences), but also to utilise the opportunities arising from them (i.e. maximise positive consequences).	366
	vulnerability of supply chain to ewes is capable of creating significant business impacts, even without the business concerned being directly affected by the event.	367
Miscellaneous		
Results	-	
Other important facts	however, not many studies have been undertaken to study how the construction organisations have managed ewes	364
	however, Berkhout et al. (2004) reported that businesses found it difficult to relate climate change and ewe’s to the risk models that they currently use.	365
	will be around 2000 - 3000 additional business failures in the uk due to the disruptions caused by the heavy winter snowfall in 2009	366
	many of these businesses would be from the construction and retail sectors (Mcwilliams, 2009)	366
Future research investigations	importance of further study on the issue at hand and sets the scene for this research	370
	need for a tool to be used by sMes enabling them to make better business decisions with regard to ewes	370

		60
Name	Whiteman	
First Name	Gail	
Title	Bringing feedback and resilience of high-latitude ecosystems into the corporate boardroom	
Year	2004	
Co-Authors	Forbes, Bruce C.; Niemelä, Jari; Chapin III, F. Stuart	
Type of Article	Research Paper	
Published by	Allen Press Publishing Services Inc	
Initiated by	University	
Ref.-ID	4668	
Ref.-type	Journal article	
Journal	AMBIO – A Journal of Human Environment	
Volume	33	
Issue	6	
pages	371-376	
Level of examination	Organization	
Country of origin	Netherlands	
Subject	Environmental Sciences, Engineering	
Industry sector	Cross-sector	
Country	-	
Continent	-	
Ranking		
ISI-Factor	2.486	
VHB JQ2	-	
Handelsblatt	-	
Source	Google Scholar	
Search term	Searched within reference list	
Abstract	<p>This paper discusses the role of companies in high-latitude regions which are conceptualized as socially and economically mediated ecosystems, and identifies a number of important social actors within the business environment. We present three examples of corporate activity at high latitudes and discuss a variety of common threads. Notably, we argue that business theory and practice needs to move beyond a narrow social or economic concept of organizational resilience and embrace the ecological resilience of high-latitude regions as a business management goal. We also suggest that regional ecosystem resilience needs to become a meaningful measure of sustainable corporate governance, one that corporate boards of directors can review and commit to. The paper concludes with a call for a detailed research agenda on the role of transnational and national companies within high-latitude regions.</p>	
Code	Segment	page
Aim of article	This paper discusses the role of companies in high-latitude regions, which are conceptualized as socially and economically mediated ecosystems, and identifies a number of important social actors within the business environment	371
	we argue that business theory and practice needs to move beyond a narrow social or economic concept of organizational resilience and embrace the ecological resilience of high-latitude regions as a business management goal.	371
Adaptive capacity		
Definition	-	
Thesaurus	According to Folke et al. (4) resilience of social-ecological systems is related to i) the magnitude of shock that the system can absorb and remain within a given state, ii) the degree to which the system is capable of self-organization, and iii) the degree to which the system can build capacity for learning and adaptation	371
	From an ecological perspective, resilience is concerned with the long-term capacity of an ecosystem to rejuvenate itself (5)	371
	Management practices that focus on flexibility and adaptive learning can help build system resilience	372

	i) through an expanded concept of organizational resilience that includes measures of regional ecosystem resilience; and ii) through corporate governance mechanisms	373
	Resilience is a concept that is well recognized in the corporate world. The concept typically refers to the social or economic resilience of corporate employees, of organizational teams, specific companies, and/or industries in the face of social or economic stress or vulnerability (19, 20)	373
	The fact that resilience is an integral part of corporate strategies suggests, however, that the concept could be expanded to include ecological dimensions without a complete shift in corporate paradigm	373
	Measures of high latitude ecosystem resilience (1) suggest that current and future stresses on these ecosystems may result in a severe loss of system resilience which may lead to alternative, undesired states in which the ecosystem differs fundamentally from its original state (35, 36)	375
Characteristics	-	
Adaptation	-	
Strategy		
Strategy development	From a systems perspective, companies are active managers that create and react to positive and negative feedback loops within their business system. Most business strategies are designed to generate positive feedback loops that enhance corporate advantages (e.g. investment in advertising to create more demand, which increases profits; investment in infrastructure to produce more products, which increases income)	372
Climate Change Strategy	-	
Relevance for decision-making	-	
	The business environment interconnects these systems and provides important feedbacks that affect the long-term functioning of high-latitude regions (6)	371
	Changes in high-latitude ecosystems have immediate implications for companies functioning in the north. For example, global warming has begun to interfere with efforts to discover more oil in Alaska	372
Business relevance	This behavior creates additional feedback loops that connect business activities to ecological systems. Unless companies notice and constructively manage these linkages, the resulting malfunctioning or incomplete feedbacks between the social, economic and ecological systems can reduce regional resilience	372
	This approach to organizational resilience renders it a 'denatured' concept (23) that largely ignores feedbacks to ecological components of the system (for exceptions, 12, 24)	373
	However, one of the difficulties in bringing ecological resilience into the boardroom may be the difference in time scales between corporate thinking and ecological time spans. Many companies work in rather short time scales (years or tens of years) as compared to high-latitude ecosystems that may require hundreds of years to recover (if they have enough resilience) from human-caused disturbance	375
Miscellaneous		
Results	While companies may be increasingly aware of the need to manage ecosystems and to pay attention to environmental indicators, such as the GRI, such actions may not be sustainable if ecosystem resilience has not been integrated into a company's culture and formal governance mechanism	375
	While flexibility and learning is key (12), further efforts at new learning, across companies and industries, must be made	375
	Whereas ecological feedbacks have a strong physical basis, business feedbacks are socially and economically mediated and are somewhat less predictable. A business environment can thus create and respond to positive and negative feedback loops in an economic, social and ecological sense (6)	372
Other important facts	If drilling in the ANWR were to proceed, the resulting environmental impacts could generate additional social-ecological feedback loops that were not a component of the original corporate strategy.	372
	Henderson Global Investors, or from the Dow Jones Sustainability Index, which rank companies on their social and environmental performance.	373

Future research investigations	In order to answer these questions, we believe that it is necessary to identify which companies and other actors (Fig. 1) are involved in the region and to understand how these boardrooms are governed. We thus propose the need for a comprehensive audit to identify relevant corporate activity. This would include an analysis of corporate policies, programs, public relations strategies, and practices	376
	In addition, it would be useful to identify other key actors such as the governments, international financing institutions, as key consumer segments, and civil society groups, which can help provide companies with important feedback	376

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Abstract

Within the last decade research on climate change strategies and adaptive capacity emerged as the debate about climate change was intensified with the publishing of the Third Assessment Report by the Intergovernmental Panel on Climate Change in 2001. That companies are facing risks and opportunities is not new and the awareness to address these issues is growing. However, there is still need for research in the field of corporate strategic response to climate change. Recently, research focused on resilience management to address climate change. Resilience management is about being able to experience changes and remain stable getting back into the same situation before the change happen. On the contrary to resilience management adaptive capacity is about the ability to be able to adapt to uncertain and unexpected events on the long term. This includes long-term changes. This work argues that companies should think about their adaptive capacity as climate change induces short and long-term changes. Adding this dimension to the strategic planning companies need to think of how they can improve their adaptive capacity.








This work investigates research in both issues adaptive capacity and climate change research and in their relation. Applying a systematic literature review this study conducted 60 references which are examined by a qualitative-quantitative analysis and answers the following questions: What is the current scientific view of adaptive capacity within strategic management literature? What are determinants of adaptive capacity? How can adaptive capacity be linked to climate change strategy and is it even antecedent to climate change strategies? The findings of this research indicate that adaptive capacity and climate change strategies exhibit a link but it cannot be proved whether adaptive capacity is antecedent. Furthermore, the term adaptive capacity is merely discussed within strategic management literature and if it is discussed and examined, several concepts and theories are applied to explain determinants of adaptive capacity. Several concepts such as dynamic capabilities, organizational learning capability, organizational learning, organizational change capacity, flexibility and more could be identified as concepts enhancing adaptive capacity. This works provides an overview of related concepts and theories.

Keywords: Adaptive Capacity; Climate Change Strategy; Corporate Strategy; Strategy formulation; Systematic literature review; Adaptation; Business; Management; Capabilities

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