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**EXTENDING ABSORPTIVE CAPACITY FROM THE MICROFOUNDATIONS
PERSPECTIVE**

Master's Thesis in
Strategic Business Development

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ABSTRACT

Success in a competitive business environment can be a question of innovation skills. One way to explore a firm's innovative capabilities is to measure its absorptive capacity: the ability to acquire, assimilate, transform and exploit knowledge. The purpose of this study is to discover the practices and routines that support the development of high absorptive capacity. Identifying the microfoundations of the construct provides practical information about ways to improve firm performance.

The study provides an overview of the absorptive capacity construct, its antecedents and outcomes. The emphasis is on Zahra and George's (2002) reconceptualization, which is used as the framework of the study. The empirical part is based on the four-dimensional model of absorptive capacity and it examines the practices of knowledge acquisition, assimilation, transformation and exploitation in the Finnish food manufacturing industry. Examples from five case companies with above average absorptive capacity help to explain what kind of mechanisms firms can use and what kind of efforts they must make in order to improve their absorptive capacity.

The study contributes to the research of the microfoundations of absorptive capacity and supports the operationalization of the construct. The results indicate that while there are common factors that enhance absorptive capacity in general, each of the four dimensions have their specificities. Analyzing and comparing the case companies shows certain practices in each dimension that together build up to a high absorptive capacity and thereby to gaining a competitive advantage.

KEYWORDS: Absorptive capacity, microfoundations, competitive advantage, knowledge, innovation

1. INTRODUCTION

The business environment of today is perceived to be more and more turbulent. In changing, fast paced markets, a firm's capability to efficiently acquire, assimilate, transform, and exploit knowledge is increasingly important. These capabilities form a firm's absorptive capacity, which is studied in this thesis. (Zahra & George 2002; Xinhua, Taibo, Baojun & Cuiling 2009; Volberda, Foss & Lyles 2010.) In order to be successful in leveraging the knowledge that has been absorbed, firms must incorporate the assimilated knowledge into their operations (Zahra & George 2002). Each phase of absorptive capacity involves specific practices and routines that together form a dynamic capability that increases the competitive advantage of a firm.

The significance of the absorptive capacity construct is widely recognized by scholars and it has become one of the most important topics within modern management research. It is applicable in many fields of management research and has been used to explain a number of organizational phenomena. (Zahra & George 2002; Xinhua, Taibo, Baojun & Cuiling 2009; Volberda, Foss & Lyles 2010.) However, there is ambiguity regarding the formation of absorptive capacity. This paper aims to shed light on the routines of firms with high absorptive capacity and explain how they create value from their practices. Exploring the mechanisms that underpin the development of absorptive capacity is seen as a way to improve practical understanding of the complex nature of the construct.

The study examines absorptive capacity in the context of Finnish food manufacturing business, thereby providing valuable information on the innovation mechanisms of a low technology industry. The focus of the empirical part is on an area of research that has received limited attention: the microfoundations of absorptive capacity. Microfoundations are "the internal and external metaroutines that make up an organization AC capabilities" (Lewin, Massini & Peeters 2011: 82). Certain factors facilitate absorptive capacity which is followed by superior firm performance (Zahra & George 2002). Firms can use specific organizational mechanisms that enhance their absorptive capacity and help them to manage it accordingly (Jansen, van den Bosch &

Volberda 2005). The metaroutines are expressed in the form of firm practises (Lewin et al. 2011).

The study uses a mixed method analysis to gain insight into the absorptive capacity practices of firms in the Finnish food manufacturing industry. A quantitative cluster analysis provides a base for qualitative cross-case and within-case analyses. The case examples are used to present and discuss the metaroutines of firms with above average absorptive capacity. Through the case analysis, the study offers evidence of ways by which absorptive capacity can be enhanced and a competitive advantage can be achieved.

1.1. Purpose of the study

The purpose of this study is to examine the concept of absorptive capacity and to define its antecedents and outcomes by using case examples from the Finnish food manufacturing industry. More specifically, the study focuses on how absorptive capacity enables product novelty, superiority and success. The study aims to define the microfoundations of absorptive capacity and assess their effects on the innovation performance of firms. The research question of the study is:

“What are the microfoundations of absorptive capacity and why do those microfoundations enable product novelty, superiority and success?”

There are three objectives to the study that need to be addressed in order to answer the research question. These objectives are:

- To identify and describe the dimensions of absorptive capacity
- To describe the microfoundations of absorptive capacity
- To study the knowledge acquisition, assimilation, transformation and exploitation practices of companies in the Finnish food manufacturing industry

The study aims to build an understanding of the dynamics of absorptive capacity before proceeding to answering the research question. With the above defined objectives, a theoretical background for the study is built. The study addresses issues related to managing the knowledge that builds a firm's absorptive capacity and examines its complex structures through a literature review. Volberda et al. (2010) observe that there is a need to develop a deeper understanding of what actually constitutes absorptive capacity, i.e. the microfoundations of absorptive capacity. This study aims to contribute to this area of absorptive capacity research.

In the theory chapter, findings of different absorptive capacity studies are presented and compared. The main focus, however, lies in Zahra and George's (2002) study: *Absorptive capacity: A Review, Reconceptualization, and Extension*. It serves as a framework for the study and the empirical analysis is conducted according to the dimensions Zahra and George (2002) have identified. The significance of their reconceptualization is supported with evidence found in management literature.

1.2. Outline of the study

As mentioned before, Zahra and George's (2002) reconceptualization of absorptive capacity forms the backbone of the study. Absorptive capacity is viewed as a dynamic capability and the empirical material is analyzed in terms of knowledge acquisition, assimilation, transformation and exploitation. The emphasis is on the microfoundations of absorptive capacity, a concept introduced by Lewin, Massini and Peeters (2011), which means that the empirical part focuses on the practiced routines of the case companies.

The study reviews both antecedents and outcomes of absorptive capacity to provide a base for examining the routines that improve innovation performance. The aim is to distinguish the practices behind high absorptive capacity and illustrate ways that firms can use to enhance their skills in knowledge acquisition, transformation, assimilation and exploitation. Case examples are incorporated in the analysis to connect theory to practice and enhance understanding of the development of absorptive capacity within a firm.

The absorptive capacity construct consists of multiple levels and external knowledge sources are critical to the innovation process regardless of the organizational level of the innovating unit in question (Lane, Koka & Pathak 2006; Cohen & Levinthal 1990). This study, however, focuses primarily on the firm level and the corporate characteristics of absorptive capacity are highlighted over the characteristics of firm members' personal absorptive capacity. Individual and unit levels are acknowledged in the analysis of the microfoundations of absorptive capacity.

1.3. Structure

The study consists of five main chapters. Introduction is the first one presenting the general idea and the main purpose of the study. Introduction is followed by the theory chapter, which summarizes previous research on the absorptive capacity construct and provides an overview of the topic. The third chapter is research methodology, and it describes the data collection, case selection, data analysis and measures of the study. The fourth chapter, analysis and discussion, presents the empirical findings. Finally, the last chapter summarizes and concludes the study with theoretical contributions, managerial implications and recommendations for future studies.

2. ABSORPTIVE CAPACITY AND ITS MICROFOUNDATIONS

This theoretical part of the study examines the concept of absorptive capacity and its microfoundations. Besides Zahra and George's (2002) work, which provides the theoretical framework for the study, the chapter also reviews other significant research on absorptive capacity and its microfoundations. First, the definitions of the absorptive capacity are presented, followed by a description of the antecedents of the construct. Then, the chapter moves to an exploration of how absorptive capacity is developed and introduces the contingent factors. To improve understanding of the underlying processes and mechanisms of absorptive capacity, the distinction between potential and realized absorptive capacity is clarified and combinative capabilities are examined. From this base, the concept of microfoundations is defined. Then, the chapter reviews the outcomes of absorptive capacity, which is followed by a description of the moderating effects and measurements of the construct. Finally, the chapter concludes by presenting reactions to Zahra and George's (2002) model. The overall intent is to assess various aspects of absorptive capacity before proceeding to the empirical analysis, which utilizes this information.

2.1. Defining absorptive capacity

The concept of absorptive capacity was first introduced by Cohen and Levinthal (1990), who label absorptive capacity as a firm's ability to recognize the value of new, external information, assimilate it, and apply it to commercial ends. Their definition is commonly referred to in management literature and other researchers, such as Zahra and George (2002), have based their own definitions on it. The significance of the absorptive capacity construct is widely recognized by scholars and it has become one of the most important topics within modern management research. It is applicable in many fields and has been used to explain a number of organizational phenomena. (Zahra & George 2002; Volberda, Foss & Lyles 2010.)

Van den Bosch, Volberda and de Boer (1999) offer a slightly different definition. According to them, absorptive capacity comprises evaluation, acquisition, integration, and the commercial utilization of new outside knowledge. Cohen and Levinthal (1990)

suggest that firms need outside knowledge to create absorptive capacity while van den Bosch et al. (1999) assume that knowledge integration is a part of the concept of absorptive capacity itself.

In 2002 Zahra and George reconceptualized absorptive capacity as a dynamic capability consisting of a set of organizational routines and strategic processes, by which firms acquire, assimilate, transform, and exploit knowledge for the purpose of value creation. They use four dimensions instead of three and make a distinction between a firm's potential capacity and realized capacity suggesting that absorptive capacity exists in two separate subsets. Potential absorptive capacity consists of knowledge acquisition and assimilation and realized absorptive capacity consists of knowledge transformation and exploitation. Acquisition of knowledge refers to identifying and obtaining outside knowledge that is critical to a firm's operations and assimilation includes the processing and internalization of externally generated knowledge. Transformation on the other hand is the process of developing and refining the routines that help a firm to combine existing knowledge with the newly acquired and assimilated knowledge. Knowledge can be added, deleted or simply interpreted in a new way. Lastly, exploitation denotes the incorporation of the acquired and transformed knowledge into a firm's operations. The emphasis is on the routines that enable refining, extending, and leveraging existing competencies or developing new ones. (Zahra & George 2002.)

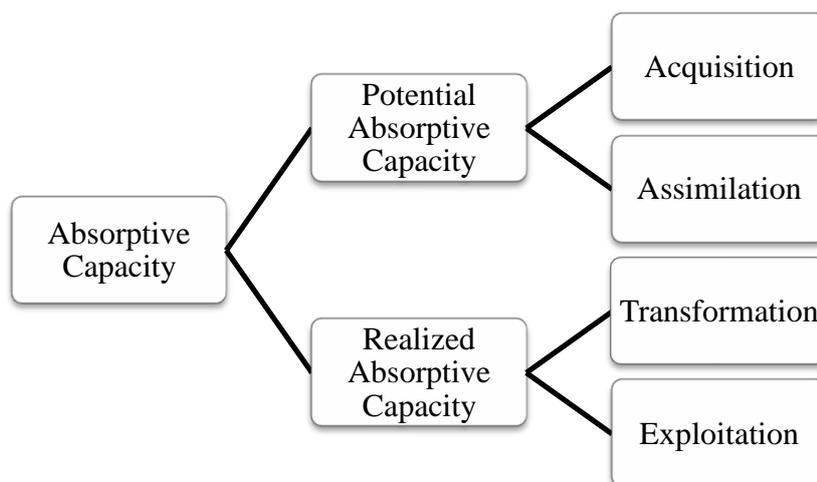


Figure 1. Zahra and George's (2002) model of absorptive capacity.

| Study | Definition |
|-----------------------------|---|
| Cohen & Levinthal (1990) | The ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends. |
| van den Bosch et al. (1999) | Evaluation, acquisition, integration, and the commercial utilization of new outside knowledge. |
| Zahra & George (2002) | A set of organizational routines and strategic processes by which firms acquire and assimilate (potential absorptive capacity) and transform, and exploit (realized absorptive capacity) knowledge for the purpose of value creation. |
| Lane et al. (2006) | A firm's ability to utilize externally held knowledge through three sequential processes: exploratory learning, transformative learning, and exploitative learning |
| Todorova & Durisin (2007) | Recognizing the value, acquiring, transforming or assimilating, and exploiting knowledge. |
| Murovec & Prodan (2009) | A two-factor structure comprising a science-push component and demand-pull component. |

Table 1. Definitions of absorptive capacity.

Zahra and George (2002) bring a new angle to the past research of absorptive capacity with their definition. According to Zahra and George (2002), absorptive capacity is a dynamic capability consisting of knowledge creation and utilization and it gives a firm an opportunity to gain and sustain a competitive advantage. While Cohen and Levinthal (1990) focus on the externally acquired knowledge, Zahra and George put emphasis on the processes and “dynamic capabilities geared toward strategic change and flexibility wherein firms create and exploit new knowledge by transforming acquired knowledge” (2002: 198).

In line with Cohen and Levinthal, Lane et al. (2006) separate absorptive capacity into three dimensions. They, however, offer a more detailed, learning process oriented definition and identify absorptive capacity as a firm's ability to benefit from outside knowledge through exploratory learning, transformative learning and exploitative learning. Those three processes are similar to Cohen and Levinthal's (1990) dimensions: exploratory learning is used to recognize and understand new external knowledge, transformative learning to assimilate external knowledge, and exploitative learning to apply the assimilated external knowledge. (Lane et al. 2006.)

Understanding the concept of absorptive capacity requires a thorough examination of the structures that form the foundation for learning (Cohen & Levinthal 1990). Lane et al. (2006) note that while Cohen and Levinthal (1990) and van den Bosch et al. (1999) emphasize exploratory learning in their definitions, Zahra and George's (2002) view puts more focus on efficient knowledge exploitation. Lane et al. (2006) find both concepts equally relevant to absorptive capacity because efficient knowledge exploitation is needed in order to achieve exploratory learning.

Todrova and Durisin (2007) enhance the definition of absorptive capacity by reintroducing recognizing the value of new information, the first component of Cohen and Levinthal's (1990) definition, redefining the transformation processes introduced by Zahra and George (2002) and clarifying the concepts of potential and realized absorptive capacity. Todrova and Durisin's (2007) research complements Zahra and George's reconceptualization of absorptive capacity and comprises recognizing the value, acquiring, transforming or assimilating, and exploiting knowledge. In Todrova and Durisin's (2007) definition of absorptive capacity, transforming and assimilating knowledge are put together to form the third component while Zahra and George (2002) see them as separate segments. Todrova and Durisin (2007) represent transformation as an alternative process to assimilation. They suggest that transformation in knowledge structures takes place when firms deal with knowledge that cannot be directly assimilated.

In contrast with Todrova and Durisin's (2007) proposition, the results of Flatten, Engelen, Zahra and Brettel's (2011) study show that transformation is an inseparable dimension of absorptive capacity. According to their empirical study, transformation is an integral component of absorptive capacity and it is not captured in the acquisition, assimilation or exploitation of knowledge. This supports the four-dimension definition of absorptive capacity presented by Zahra and George (2002).

Murovec and Prodan (2009) find Cohen and Levinthal's definition simplest and most comprehensible. They, however, propose two different types of absorptive capacity based on the distinction between two types of innovation: science-push and demand-pull. Science-push absorptive capacity is based on scientific information that is

produced by universities, non-profit research institutes or commercial R&D enterprises. Demand-pull absorptive capacity on the other hand is based on market information that can be acquired from customers, suppliers, competitors, professional conferences and fairs and is considered more important than science-push absorptive capacity for its greater impact on product and process innovation output. Nevertheless, both science-push and demand-pull are essential for an efficient assimilation of external information. (Murovec and Prodan 2009.)

2.2. Antecedents of absorptive capacity

When discussing absorptive capacity, it is reasonable to address its determinants. As shown in table 2, various researchers have identified different antecedents for absorptive capacity. Cohen and Levinthal (1990) state that in order to assimilate and use new knowledge, firms need prior related knowledge, which includes basic skills, a shared language or knowledge of the recent technological or scientific developments in the field. They also stress the importance of investing in research and development (R&D) early on.

Van den Bosch et al. (1999) acknowledge that the level of prior related knowledge is a determinant of absorptive capacity but they also suggest that organization forms and combinative capabilities constitute a firm's absorptive capacity. Van den Bosch et al. (1999) suggest that a firm's organization form and the knowledge-processing activities are strongly related to each other. Combinative capabilities, especially coordination capabilities, can be seen as an organizational determinant of absorptive capacity in Cohen and Levinthal's (1990) work as well. Cohen and Levinthal (1990) state that absorptive capacity is not dependent on any individual but comprised of linkages between multiple individual capabilities.

Lane, Salk and Lyles (2001) study international joint ventures (IJV) in the light of absorptive capacity. Their research shows that cultural compatibility and trust between the acquiring firm and the source of knowledge and relatedness of their businesses and prior knowledge from partners are the preconditions to understanding external

knowledge. IJV's business strategy and training competence affect the ability to applexternal knowledge. (Lane et al. 2001.)

Tsai (2001) also highlights the role of knowledge transfer. He maintains that organizational units perform better when they have access to new knowledge from other units. The benefits of accessing new knowledge depend on the unit's absorptive capacity. According to Tsai (2001), the interaction between a unit's absorptive capacity and networking abilities has a strong positive effect on innovation and performance.

Van den Bosch et al. (2003) emphasize the importance of shared language and suggest that prior related knowledge and internal organizational mechanisms should be considered as key antecedents of absorptive capacity. Prior related knowledge includes basic skills and learning experience, as in Cohen and Levinthal's (1990) study, and organizational mechanisms refer to internal factors like the structure of communication and distribution of knowledge.

Zahra and George (2002) suggest that absorptive capacity is largely dependent on prior experience, knowledge complementarity, and diversity of knowledge sources, thus supporting Tsai's (2001) statements about the influence of networking capabilities. Prior experience, knowledge complementarity, and diversity of knowledge sources are specifically the preconditions of a firm's potential absorptive capacity, i.e. the acquisition and assimilation of knowledge. However, firms also need the ability to transform and exploit knowledge in order to improve their performance. Incorporating the assimilated knowledge into the firms operations is how competitive advantage is fundamentally created.

In line with Zahra and George (2002), Kostopoulos, Papalexandris, Papachroni and Ioannou's (2011) study indicates that firms' knowledge base is enriched by innovation collaborations with different external parties, such as suppliers, competitors, clients and research institutions. Involvement and cooperation also develop a firms' ability to better assimilate and exploit outside knowledge. Cohen and Levinthal (1990) also recognize the importance of past experience in the development of absorptive capacity.

Lane et al. (2006) make a distinction between external and internal drivers of absorptive capacity. Drivers that are external to the firm include both internal and external knowledge, learning relationships and environmental conditions. Like Cohen and Levinthal (1990), Lane et al. (2006) acknowledge the influence of the firm's external environment on absorptive capacity. Investing in absorptive capacity is determined by the firm's environment. Internal and external knowledge have an impact on the extent of the knowledge that a firm is able to monitor and also on the level of understanding. Learning relationships on the other hand ease the understanding of knowledge. (Lane et al. 2006.)

| Study | Antecedents |
|-----------------------------|--|
| Cohen & Levinthal (1990) | The firm's level of prior related knowledge base and skills Investment in research and development early on Linkages of individual capabilities |
| van den Bosch et al. (1999) | Organization forms Combinative capabilities |
| Lane et. al (2001) | Cultural compatibility and trust between the acquiring firm and the source of knowledge, relatedness of their businesses and prior knowledge from partners Strategy and training competence |
| Tsai (2001) | A unit's ability to access other units' knowledge |
| Zahra & George (2002) | Exposure to diverse and complementary external sources of knowledge Experience |
| van den Bosch et al. (2003) | Prior related knowledge Organizational factors |
| Lane et al. (2006) | Environmental conditions Internal and external knowledge Learning relationships Firm members' mental models Firm's structures and processes Firm strategies |
| Murovec & Prodan (2009) | Internal R&D Training of personnel Innovation co-operation Attitude toward change |
| Volberda et al. (2010) | Organizational structure Reward systems Systems of human resources management practices and policies |

Table 2. Antecedents of absorptive capacity.

Firm members' mental models, firm structures and processes and firm strategies are significant internal drivers of absorptive capacity. When knowledge is combined and applied in unique ways, a firm may achieve a competitive advantage. The creativity of the recognition, assimilation and application of knowledge arises from individual mental models and the efficiency and effectiveness of assimilation and application through firm's structures and processes. Finally, the focus of recognition, understanding, assimilation and application is determined by firm strategies. In other words, the strategy defines what kind of knowledge is considered valuable and what areas of it should be assimilated and applied. (Lane et al. 2006.)

Murovec and Prodan's (2009) study suggests that internal R&D, training of personnel, innovation co-operation and attitude toward change are positively related to a firm's absorptive capacity. Volberda et al. (2010) also indicate that human capital and organizational factors shape a firm's absorptive capacity. They propose that there is a set of organizational antecedents of absorptive capacity that require more attention, such as organizational structure, reward systems, and systems of human resources management practices and policies.

2.3. Developing absorptive capacity

Daghfous (2004) gives a comprehensive overview on the determinants of absorptive capacity, which are presented throughout this chapter with links to other relevant studies. According to Daghfous (2004), absorptive capacity is affected by multiple factors that can roughly be divided into two categories: internal and external factors. Prior knowledge base, organizational structure, size, strategy and organizational responsiveness are considered as internal factors while external factors comprise external knowledge environment and knowledge network position. (Daghfous 2004.)

Cohen and Levinthal (1990) also establish that absorptive capacity can be generated in various ways. Not only do they suggest that absorptive capacity can be created as a by-product of a firm's R&D activities, they also propose that it can be developed as a side effect of manufacturing operations and directly by sending staff to technical training. According to Cohen and Levinthal (1990), a firm's absorptive capacity is largely a

function of its prior knowledge base. As stated before, Cohen and Levinthal (1990) maintain that prior related knowledge enables firms to identify the value of new information, assimilate it, and commercially exploit it. Linking new and old knowledge requires prior knowledge and skills, which results in creativity. The level of organizational responsiveness reflects how fast and flexibly a firm responds to external information it has acquired and acts according to it. (Daghfous 2004.)

The influence of firm size on absorptive capacity is debated on. A larger size may translate into greater R&D activities and thereby give rise to innovation (Daghfous 2004). Some studies show, however, that responding to changes and staying innovative is easier for smaller firms because they are less bureaucratic, their thinking is not hierarchical and they do not need the expensive information systems that larger firms usually do (Welsch, Jianwen & Stoica 2001, as cited in Daghfous 2004).

Ultimately, an organization's absorptive capacity is dependent on the absorptive capacities of individuals (Cohen & Levinthal 1990; Daghfous 2004). According to Cohen and Levinthal (1990), the intensity of an individual firm member's exposure to relevant prior knowledge is critical in developing absorptive capacity. The capacity of assimilating existing knowledge is embedded in learning capabilities whereas problem solving skills involve the capacity of creating new knowledge. Daghfous (2004) emphasizes the importance of organizational learning and investing in activities such as employee training.

Absorptive capacity is also shaped by human resource management policies. Delegation of responsibility, planned job rotation programs, systematical collection of employee proposals, multidisciplinary workgroups, and pay for performance are practices that affect the acquisition and assimilation of knowledge. Firm competencies and absorptive capacity can also be enhanced by recruiting the right people and continuous learning can be motivated by using reward systems. (Daghfous 2004.)

Another factor that affects a firm's absorptive capacity is cognitive distance between partners, i.e. the degree of dissimilarity in knowledge bases. Dissimilarity is inevitable to some degree but certain basic perceptions and values need to be shared for aligning

competencies and motives. (Nooteboom, Van Haverbeke, Duysters, Gilsing & van den Oord 2007.) Thereby Gilsing, Nooteboom, Vanhaverbeke, Duysters and van den Oord (2008) state that having a large cognitive distance between partners has a negative effect on absorptive capacity. In order to utilize opportunities, a sufficient mutual understanding and cognitive proximity is needed. Gilsing et al. (2008) note, however, that a large cognitive distance may enhance the potential of novelty creation. Knowledge diversity also increases a firm's potential to make novel associations and linkages and thereby strengthens both assimilative and innovative capabilities (Gilsing et al. 2008). Firms that have a diverse background of knowledge can relate incoming information easier to what they already know (Cohen & Levinthal 1990).

Lane and Lubatkin (1998) find that the more similar the knowledge base, formalization of lower management, centralization of research, compensation practices and research communities of partners, the more effectively knowledge can be managed and learning facilitated. When learning in a specific area is increased, the organization's knowledge base in that domain is enhanced. Thereby the organization's absorptive capacity is strengthened and learning is further reinforced. (Roberts, Galluch, Dinger & Grover 2012.)

Lenox and King (2004) find that absorptive capacity can even be directly developed by managers. The more information managers provide to potential adopters within the organization, the greater the adoption and eventually the firm's absorptive capacity will be. The effectiveness of developing absorptive capacity through internal information provision is increased if the adopter has prior related knowledge. As shown in chapter 2.2., other researchers (e.g. Cohen & Levinthal 1990) recognize the importance of prior related knowledge in building a firm's absorptive capacity as well.

Communication between the organization and the external environment is important, as well as among units and members within the organization. In addition to technical expertise, it is also critical to be aware of where or with whom useful and complementary knowledge resides both within and outside the organization. (Cohen & Levinthal 1990.) Organizational structure has an effect on how well the acquired knowledge can be transferred within the organization to those involved. The

organization should be flat, dynamic, adaptable, flexible, participative, and have minimal bureaucracy. Highly bureaucratic firms tend to be reluctant to change and innovation. Absorptive capacity is higher when communication between different departments is allowed. (Daghfous 2004.)

As Daghfous (2004) brings out, organizational culture and top management's efforts play important roles in developing a firm's absorptive capacity. Empowering employees encourages a knowledge-sharing culture whereas applying power through authority negatively affects organizational learning. Noblet, Simon and Parent (2011) make a similar finding, suggesting that the companies that are most transparent and the companies whose leaders are most open tend to have a stronger absorptive capacity and thereby possess a greater capacity for innovation than others. Zahra and George's (2002) discussion does not directly address the manager's role in developing absorptive capacity but managerial roles are recognized to have an influence on the process.

Daghfous (2004) acknowledges the importance of external environment to the development of absorptive capacity. New knowledge lies outside organizational boundaries and therefore constant interaction with the external environment is required in order to improve capabilities. Daghfous (2004) also notes that the strength of a firm's relationships with knowledge institutions (e.g. technical support, consultants and academic institutions) and other members of the knowledge network is a significant external determinant of absorptive capacity.

When a firm wishes to exploit knowledge that is closely related to its current activity, absorptive capacity is likely to be developed and maintained as a by-product of the firm's routines. When knowledge is unrelated to a firm's current knowledge base, acquiring and using it requires conscious effort. (Cohen & Levinthal 1990.) Determining the routines and processes firms use in acquiring, assimilating, transforming, and exploiting knowledge is central to the analysis of absorptive capacity development (Zahra & George 2002).

Daghfous (2004) recognizes the four elements of absorptive capacity introduced by Zahra and George (2002) and recommends certain practical mechanisms for firms to

develop their abilities to acquire, assimilate, transform and exploit knowledge. First, firms should show commitment to enhancing and utilizing their knowledge base. Resources should be invested in learning programs and the employees' level of knowledge should be improved. Although the profits from such investments are not immediate, firms should not give up on them. Second, communication across functional boundaries and brainstorming and solving problems as a team should be encouraged.

Third, managers should be flexible and not demand too much from the employees. Top management's efforts are required in creating a learning organization. Fourth, the organizational culture should be open to change and employees should feel free to suggest improvements to the processes and experiment with new ideas. Fifth, firms should have places like chat rooms and intranets where employees can communicate and get together with each other. Sixth, when evaluating performance, knowledge sharing should be included as a criterion. Rewarding and giving recognition to employees who successfully create and share knowledge helps in preventing knowledge hoarding. Finally, knowledge transfer within the firm should be facilitated by sharing organizational knowledge informally, conducting seminars and workshops and promoting open communication. (Daghfous 2004.)

2.3.1. Contingent factors

Contingent factors have a role in the development of absorptive capacity. Under their effect absorptive capacity ultimately leads to competitive advantage (Zahra & George 2002). Contingent factors of absorptive capacity include activation triggers, social integration mechanisms, appropriability regimes and power relationship (Zahra & George 2002; Todrova & Durisin 2007).

2.3.1.1. Activation triggers

Zahra and George (2002) suggest that there are specific triggers that activate absorptive capacity by moderating the impact that knowledge sources and experience have on acquisition, assimilation, transformation, and exploitation of knowledge. The triggers are defined as "events that encourage or compel a firm to respond to specific internal or external stimuli" (Walsh & Ungson; Winter, as cited in Zahra & George 2002: 193).

Organizational crises, performance failure and significant events such as mergers are considered as internal triggers while for instance technological shifts, drastic innovations and changes in government policies work as external triggers.

Zahra and George (2002) propose that the relationship between the source of knowledge and experience and potential absorptive capacity is influenced by activation triggers. The source of an activation trigger affects the locus of search for outside knowledge in particular. As for the intensity of the trigger, the effect is on the investments in developing the necessary acquisition and assimilation capabilities. In other words, in addition to the past experience and diverse and complementary sources of knowledge, the development of potential absorptive capacity is influenced by activation triggers that reconfigure acquisition and assimilation of knowledge over time by redefining the locus of search. (Zahra & George 2002)

2.3.1.2. Social integration mechanisms

Social integration mechanisms are organizational parameters that make it easier for firms to share and eventually exploit knowledge. Social integration can occur either formally, for example as the use of coordinators, or informally, as in social networks. Informal mechanisms work well in exchanging ideas while formal mechanisms allow a more systematic integration of knowledge. With formal social integration mechanisms information can effectively be distributed within the firm, interpretations can be gathered and trends can be identified. (Zahra & George 2002.)

According to Zahra and George (2002), the gap between potential and realized absorptive capacity is reduced with the use of social integration mechanisms. The efficiency factor, the ratio of realized absorptive capacity to potential absorptive capacity, is therefore increased. The efficiency factor is further explained in chapter 2.4.1. Social integration mechanisms help in breaking down the barriers of information sharing, increasing the efficiency of knowledge assimilation and transformation. (Zahra & George 2002.)

Todrova and Durisin (2007) propose a different kind of view on social integration. According to them, social integration influences all processes of knowledge absorption and different processes are affected in different ways. The influence of social integration on a firm's absorptive capacity can be either negative or positive, depending on the type of new knowledge and the type of knowledge processes. (Todrova and Durisin 2007.)

2.3.1.3. Appropriability regimes

“Appropriability regimes” is a term that is used to describe the probability of imitation (Teece 1998). Appropriability is a function of “the ease of replication” as well as of “the efficacy of intellectual property rights as a barrier to imitation” and the conditions range from weak to strong (Teece 1998: 66). Appropriability is weak when a technology is easy to replicate and intellectual property is not available or it's ineffective. When a technology is difficult to replicate and intellectual property systems prevent imitation by law, appropriability is strong. (Teece 1998.)

Cohen and Levinthal (1990: 139) refer to appropriability conditions as “the degree to which firms capture the profits associated with their innovative activity” and consider them to be a reflection of “the degree to which valuable knowledge spills out into the public domain”. Absorptive capacity mediates the effects of appropriability. According to Cohen and Levinthal (1990), spillovers have a positive effect on R&D when they are in interaction with an internal absorptive capacity. Their framework supports a negative appropriability incentive: the more competitors' spillovers there are the more interested firms are in investing in their own R&D. Spending more on R&D allows firms to effectively exploit those spillovers. (Cohen and Levinthal 1990.)

Zahra and George's (2002) approach is different from Cohen and Levinthal's (1990). Zahra and George (2002) suggest that when strong regimes of appropriability exist, the costs of imitation are high and therefore the relationship between realized absorptive capacity and sustainable competitive advantage is significant and positive. On the contrary, under weak appropriability regimes the relationship between realized absorptive capacity and sustainable competitive advantage is expected to be weak or

non-existent. In order to create a significant and positive relationship between realized absorptive capacity and competitive advantage when the regimes of appropriability are low, firms must use isolating mechanisms to protect their knowledge resources and capabilities. (Zahra & George 2002.) Isolating mechanisms are barriers for imitation (Mahoney & Pandian 1992).

Todrova and Durisin (2007) acknowledge both Cohen and Levinthal's (1990) and Zahra and George's (2002) contributions to the subject of appropriability regimes. However, they extend the idea further by combining the two conceptualizations. They maintain that more research is required in order to determine whether the positive effects of strong appropriability regimes identified by Zahra and George (2002) can be stronger than the negative effects proposed by Cohen and Levinthal (1990).

2.3.1.4. Power relationships

In addition to proposing changes to Zahra and George's (2002) models of social integration mechanisms and appropriability regimes, Todrova and Durisin (2007) introduce a new contingent factor to enhance the understanding of how absorptive capacity works: power relationships. As cited by Todrova and Durisin (2007: 782), Pfeffer has defined power relationships as the relationships involving "the use of power and other resources by an actor to obtain his or her preferred outcomes". Power relationships can be both external and internal to the firm and they influence the knowledge absorption processes firms use to achieve their goals (Torova & Durisin 2007).

2.4. Processes and mechanisms

Certain organizational processes and mechanisms that underlie absorptive capacity can be recognized. As stated in the definition of absorptive capacity given by Zahra and George (2002), a firm's routines and processes construct a dynamic capability. Potential absorptive capacity and realized absorptive capacity are reviewed in chapter 2.4.1. to facilitate the understanding of the processes and mechanisms associated with the construct. Chapter 2.4.2. provides an overview of combinative capabilities embedded in organizational processes that affect a firm's ability to acquire, assimilate, transform and

exploit knowledge. The previous chapter about developing absorptive capacity supports the discussion about the processes and mechanisms, and thereby the microfoundations of absorptive capacity. The concept of microfoundations is addressed more specifically in chapter 2.5.

2.4.1. Potential and realized absorptive capacity

As previously mentioned, Zahra and George (2002) divide absorptive capacity into two blocks: potential absorptive capacity, which consists of knowledge acquisition and assimilation and realized absorptive capacity, which consists of knowledge transformation and exploitation. Numerous researchers agree on the importance of Zahra and George's (2002) contribution to absorptive capacity literature and incorporate the idea of two separate subsets into their own studies (e.g. van den Bosch, van Wijk & Volberda 2003; Lane et al. 2006; Todrova & Durisin 2007; Fosfuri & Tribó 2008; Volberda et al. 2010; Lewin et al. 2011). Because of the significance of Zahra and George's reconceptualization of potential and realized absorptive capacity, their study has been chosen as the foundation of this thesis.

Zahra and George (2002) maintain that the two subsets of absorptive capacity affect the development of a firm's competitive advantage in different ways and involve different processes and mechanisms, which makes it necessary to distinguish between them. The paths that organizations follow in developing their core competencies are flexible and nonlinear. By differentiating between potential and realized absorptive capacity, those paths are easier to observe and examine. In addition to competitive implications, the findings indicate that different kinds of managerial roles are necessary for potential and for realized absorptive capacity. (Zahra & George 2002.)

Zahra and George (2002) also introduce the term "efficiency factor", which describes the ratio of realized absorptive capacity to potential absorptive capacity. Variations in the transformation and exploitation capabilities are the reason why firms "vary in their ability to create value from their knowledge base" (Zahra & George 2002: 191). When the efficiency factor is high, realized absorptive capacity approaches potential absorptive capacity. Hence, assuming that profits are mainly generated through realized

absorptive capacity, achieving or maintaining a high efficiency factor leads to increased performance. Jansen, van Den Bosch and Volberda's (2003) empirical study supports this theory. By exploring the relationship between potential and realized absorptive capacity, they find distinct organizational and performance implications of different ratios of realized to potential absorptive capacity.

Zahra and George (2002: 185) note that the operations that comprise a firm's potential absorptive capacity, the acquisition and assimilation of knowledge, have received far less empirical attention than the operations of realized capacity, the transformation and exploitation of knowledge. Fosfuri and Tribó's (2008) study focuses on filling this gap. Their results show that R&D cooperation, external knowledge acquisition and experience with knowledge search are the most significant antecedents of a firm's potential absorptive capacity. Fosfuri and Tribó (2008) also observe that firms put more effort into improving their absorptive capacity in times of major internal shifts that reshape the strategy, the design of the organization and the marketing of the firm. Efficient internal knowledge flows decrease the distance between potential and realized capacity, thereby facilitating the achievement of a competitive advantage.

2.4.2. Combinative capabilities

In 1992 Kogut and Zander introduced combinative capabilities as determinants of innovations, referring to the "intersection of the capability of the firm to exploit its knowledge and the unexplored potential of the technology" (Kogut & Zander 1992: 391). It is apparent that combinative capabilities are closely linked to both potential and realized absorptive capacity (Jansen et al. 2005). Van den Bosch et al. (1999) identify three different types of combinative capabilities that influence a firm's absorptive capacity: systems capabilities, coordination capabilities, and socialization capabilities. Van den Bosch et al. (1999) consider combinative capabilities as an antecedent of absorptive capacity.

Systems capabilities, such as policies, procedures, direction, and manuals, are often used for integrating explicit knowledge. Exchanging and combining explicit knowledge through combinative capabilities is formal and efficient. However, the routine and

inflexibility of using formal language, codes, working manuals and information systems may result in a weakened absorptive capacity. (van den Bosch et al. 1999.)

According to van den Bosch et al. (1999), coordination capabilities describe the degree to which knowledge absorption occurs through relationships between group members. Resulting from training and job rotation, linkages between units or individuals, and participation, coordination capabilities enable controlling, coordinating, and absorbing knowledge in a firm (Bosch et al. 1999). Urbancová (2013) recognizes the significance of knowledge and experience sharing in the innovation process as well and stresses the importance of responding to the demands of a turbulent business environment. Such capabilities are the source of profitability and success (Urbancová 2013).

Van den Bosch et al. (1999: 557) refer to socialization capabilities as “the ability of the firm to produce a shared ideology that offers members an attractive identity as well as collective interpretations of reality”. Beliefs and values are infused into a firm over time and they give firm members a strong, shared identity. Sharing the same language and culture may translate into efficiency but it can have harmful effects on knowledge absorption both in terms of scope and flexibility. Having a collective mindset leaves little room to absorbing external knowledge and therefore weakens the firm’s absorptive capacity. (Van den Bosch et al. 1999.)

Jansen et al. (2005) focus on the unit level and use the three types of combinative capabilities introduced by van den Bosch et al. (1999) as a structure for their analysis. Jansen et al. (2005) suggest that combinative capabilities include specific organizational mechanisms that influence potential and realized absorptive capacity in different ways. Cross-functional interfaces, participation, job rotation and other organizational mechanisms associated with coordination capabilities mainly affect a firm’s potential absorptive capacity whereas organizational mechanisms related to socialization capabilities, socialization tactics and connectedness, enhance a firm’s realized absorptive capacity. Formalization, a part of systems capabilities, impacts a unit’s realized absorptive capacity without decreasing its potential absorptive capacity. Routinization, however, has a negative influence on a unit’s potential absorptive capacity as well as on transformation, which is the first dimension of a unit’s realized

absorptive capacity. Their study indicates that all organizational units may not have the same ability to manage levels of potential and realized absorptive capacity and to create value from their absorptive capacity. In other words, their developmental paths may differ. (Jansen et al. 2005.)

2.5. Microfoundations

In order to comprehensively understand how absorptive capacity arises and what behavioural mechanisms increase it, the analysis should be directed towards the microfoundations of the construct (Volberda et al. 2010). Microfoundations can be defined as "foundations of something, namely aggregate concepts and/or relations between aggregate variables" (Foss 2010). In this paper, microfoundations, or metaroutines, are the foundation of practiced routines, which together constitute a firm's absorptive capacity (Lewin et al. 2011).

According to Gupta, Tesluk and Taylor (2007), researchers should study high-level concepts through phenomena that takes place at lower levels. The lower-level analysis strengthens the structural base of a concept and thereby clarifies its nature (Gupta et al. 2007). Without a focus on the micro-level, the underlying organizational mechanisms cannot be defined. As a result, the relationship between routines and performance remains unclear. (Abell, Felin & Foss 2008).

By studying the microfoundational aspects of absorptive capacity, the field of strategic management can be further developed (Foss 2010). Identifying the microfoundations that support absorptive capacity helps to outline the reasons behind competitive advantage and innovation, and overcome the obscurities in absorptive capacity research (Volberda et al. 2010; Lewin et al. 2011). Rice, Liao, Galvin, and Martin (2015) maintain that observing dynamic capabilities requires an emphasis on "real and concrete resource commitments and processes". By concentrating on finding empirical evidence of the microfoundations, organisational processes can be linked to firm performance (Rice et al. 2015).

While the emphasis of strategic management research has previously been on macro constructs, a rising interest in the study of microfoundations can be noticed (Abell et al. 2008). Like Volberda et al (2010), Lewin et al. (2011) also recognize that there is a lack of research on the factors that make up a firm's absorptive capacity, i.e. the microfoundations of absorptive capacity. Lewin et al. (2011: 82) describe absorptive capacity as “a bundle of routines that encompass the ability of companies to initiate change from within as well as identify and assimilate ideas from the external environment”. Discovering the microfoundations of absorptive capacity may untangle the reasons why some firms are more successful in innovation and learning than others (Lewin et al. 2011).

Lewin et al. (2011) distinguish between internal and external capabilities that underlie knowledge acquisition, transformation, assimilation and exploitation. Internal routines refer to the practices inside the firm, such as knowledge creation, knowledge transfer and learning within the boundaries of the organization. External routines take place when the knowledge is acquired from external sources. Both internal and external routines are required for gaining the full benefits of absorptive capacity. (Lewin et al. 2011.) This idea coincides with Zahra and George's (2002) theory that potential absorptive capacity and realized absorptive capacity have unique but complementary roles.

Metaroutines comprise the “higher-level routines that define the general, abstract purpose of routines and that are expressed by practiced routines, which are firm specific, idiosyncratic, and observable” (Lewin et al. 2011: 85). Internal practices consist of the formal and informal routines that facilitate variation and enable the rise of new ideas. Moreover, sharing and integrating knowledge and effective firm practices, determining which ideas to develop and execute and re-examining old practices are included in the internal capabilities. (Lewin et al. 2011.)

The external practices include identifying outside knowledge and learning and co-operating with external parties. Lewin et al. (2011) also acknowledge the effect of social mechanisms on the level of innovation performance. In addition to internal and external practices, there are two metaroutines in between the different subsets: managing

adaptive tension and transferring knowledge back to the organization. (Lewin et al. 2011.)

Lewin et al. (2011) focus on the routine structure underlying absorptive capacity. According to their study, two conditions determine the effectiveness of absorptive capacity: the ability to develop organizational processes for addressing both internal and external metaroutines and the ability to “find complementarities between configurations of metaroutines that leverage the effectiveness of individual practiced routines”. (Lewin 2011: 95). It confirms the importance of putting focus on the microfoundations.

2.6. Outcomes of absorptive capacity

There are several outcomes that can be expected as a result of high absorptive capacity. The anticipated outcomes are listed in table 3. According to Cohen and Levinthal (1990), a high level of absorptive capacity translates into proactive behaviour. Firms with high levels of absorptive capacity are more independent than others and search for opportunities present in the environment. In comparison, firms with low levels of absorptive capacity tend to be more reactive, responding to triggers caused by failures instead of seeking out for new opportunities. Other outcomes Cohen and Levinthal (1990) list include innovative performance and expectation formation. Expectation formation allows firms to make more accurate predictions of the nature and commercial potential of technological developments (Cohen & Levinthal 1990). Kumar and Seth (2001) reflect on Cohen and Levinthal’s (1990) paper and discuss knowledge, absorptive capacity, and the theory of the diversified firms. They imply that diversification is an outcome of absorptive capacity. Diversification gives firms a competitive advantage, similarly to proactive and innovative performance presented in Cohen and Levinthal’s (1990) study.

Supporting the previous findings, the results of Tsai’s (2001: 1003) study suggest that high levels of absorptive capacity give firms “a better chance to successfully apply new knowledge toward commercial ends, producing more innovations and better business performance”. That is, firms with high absorptive capacity are more likely to have success in commercializing their new products than firms with low levels of absorptive

capacity. Zahra and George's (2002) findings follow the same pattern. They maintain that one of the reasons that it is crucial to make a distinction between potential and realized absorptive capacity is that it explains why some firms use absorptive capacity more efficiently than others. Firm performance cannot be improved without first leveraging potential absorptive capacity but a high potential absorptive capacity alone is not enough. Potential and realized absorptive capacities have separate roles that complement each other. (Zahra & George 2002.)

| Study | Outcomes |
|--------------------------|--|
| Cohen & Levinthal (1990) | Proactive behavior Innovative performance Expectation formation |
| Kumar & Seth (2001) | Diversification |
| Tsai (2001) | A better chance to successfully apply new knowledge toward commercial ends Producing more innovations Improved business performance |
| Zahra & George (2002) | Competitive advantage Strategic flexibility Innovation Improved performance |
| Lane et al. (2006) | Commercial outputs (products, services, and intellectual property) Knowledge outputs (general, scientific, technical, and organizational) Firm performance |

Table 3. Outcomes of absorptive capacity.

Fosfuri and Tribó's (2008) findings are in line with Zahra and George's (2002) theories. Their results show that firms with high potential absorptive capacity are more successful in getting larger shares of their sales from new or improved products than others. Fosfuri and Tribó (2008) also agree that potential and realized absorptive capacity have separate but complementary roles, and that firms need to develop their realized absorptive capacity to get benefits from the knowledge that has been acquired and assimilated.

Zahra and George's (2002) study suggests that competitive advantage, strategic flexibility, innovation and improved performance are the outcomes of absorptive capacity. As absorptive capacity exists in two separate subsets, different outcomes derive from different subsets. Potential absorptive capacity enables strategic flexibility while competitive advantage is created through realized absorptive capacity. Together the subsets improve firm performance and develop the firm's innovation capabilities. (Zahra & George 2002.) Urbancová (2013) also recognizes the link between innovative capabilities and a firm's competitive advantage, suggesting that innovations have a great effect on a firm's competitive advantage and therefore on a firm's economic success.

Lane et al. (2006) recognize commercial, knowledge and performance boosting outcomes for absorptive capacity. Absorptive capacity generates knowledge outputs that can be general, scientific, technical, and organizational, and commercial outputs such as products, services and intellectual property. Both sets of outputs have a further effect on firm performance, similarly to potential and realized absorptive capacity in Zahra and George's (2002) study.

2.7. Moderating and indirect effects of absorptive capacity

Numerous researchers have also found moderating and indirect effects of absorptive capacity. These effects are gathered in table 4. Escribanoa, Fosfuri and Tribó (2009) state that a high level of absorptive capacity enables an efficient knowledge flow management and generates innovative outcomes. The influence of absorptive capacity on innovation performance has a moderating effect on "the degree to which external knowledge flows affect innovation output" (Escribanoa et al. 2009: 96). Their results confirm that absorptive capacity leads to a competitive advantage.

Kostopoulos et al. (2011) agree with the general idea that absorptive capacity is a capability for identifying and translating outside knowledge into concrete advantages and innovation but they also recognize that absorptive capacity has time-lagged indirect effects on financial performance. They suggest that absorptive capacity results in innovation, which in turn leads to financial gains. Kostopoulos et al. (2011) find that

absorptive capacity enables firms to transform inflowing external knowledge into related performance benefits. (Kostopoulos et al. 2011.)

| Study | Moderating and indirect effects of absorptive capacity |
|---------------------------|---|
| Escribanoa et al. (2009) | Innovative outcomes by improving management of external knowledge flows |
| Kostopoulos et al. (2011) | Time-lagged effects on financial performance |
| Liu et al. (2013) | Improved firm performance by shaping supply chain agility |
| Engelen et al. (2014) | Strengthened relationship between entrepreneurial orientation and firm performance in turbulent markets |

Table 4. Moderating and indirect effects of absorptive capacity.

Liu, Ke, Wei and Hua (2013) on the other hand find a connection between IT capabilities and absorptive capacity. Their findings show that firms can use IT capabilities to improve the level of absorptive capacity. According to them, flexible IT infrastructure and IT assimilation have an indirect effect on firm performance through absorptive capacity.

Absorptive capacity affects firm performance indirectly by shaping supply chain agility (Liu et al. 2013). Supply chain agility can be defined as “the capability of the firm, both internally and in conjunction with its key suppliers and customers, to adapt or respond in a speedy manner to marketplace changes as well as to potential and actual disruptions, contributing to the agility of the extended supply chain” (Braunscheidel & Suresh 2009: 119). Absorptive capacity mediates the effects of supply chain agility and IT capabilities and their interaction results in improved firm performance (Liu et al. 2013).

Engelen, Kube, Schmidt and Flatten (2014) state that in turbulent markets absorptive capacity strengthens the relationship between entrepreneurial orientation (EO) and firm performance. EO refers to the processes, practices and activities that allow the principal act of entrepreneurship, new entry (Lumpkin & Dess 1996). That is entering new or established markets with new or existing markets using innovativeness, autonomy,

proactiveness, risk taking and competitive aggressiveness. According Engelen et al. (2014: 12), “the dynamic capability to acquire, assimilate, transfer, and exploit new external knowledge enables a firm to implement an entrepreneurially oriented strategic approach more effectively and efficiently than it could if it had no such capability”.

2.8. Measuring absorptive capacity

Over the past two decades, major research effort has been put into measuring absorptive capacity (Thomas & Wood 2014). Cohen and Levinthal (1990) consider R&D as a significant contributor to a firm’s absorptive capacity. Stock, Greis and Fischer (2001) and Tsai (2001) follow Cohen and Levinthal’s model and use R&D intensity, defined as R&D investment divided by sales (Cohen & Levinthal 1990), as a measure of absorptive capacity. However, absorptive capacity is complex in nature and results from multiple different factors. Therefore using R&D intensity for measuring a firm’s absorptive capacity is rudimentary (Lane et al. 2006; Lichtenhaler 2009; Camisón & Forés 2010; Volberda et al. 2010 & Lewin et al. 2011, Thomas & Wood 2014). George, Zahra, Wheatley and Khan (2001) measure absorptive capacity by R&D spending and the number of patents but these operationalizations still may not be enough to capture the whole absorptive capacity construct (Lane et al. 2006).

Zahra and George (2002) point out that the measurements of absorptive capacity are insufficient in case all dimensions are not clearly defined and the richness and complexity of the construct are not taken into account. Because researchers have made various conceptualizations and measurements of absorptive capacity, it is difficult to make comparisons between previous findings and demonstrate their theoretical and managerial relevance (Flatten et al. 2011).

With Zahra and George’s (2002) reconceptualization of the different dimensions of absorptive capacity, measuring absorptive capacity is improved. Zahra and George (2002) maintain that there are capabilities that underlie each dimension and suggest additional measurements to reinforce the focus on them. Knowledge acquisition could be measured by “the years of experience of the R&D department” or “the amount of R&D investment”, assimilation by “the number of cross-firm patent citations” or “the

number of citations" (Cockburn & Henderson 1998, as cited in Zahra & George 2002: 199), transformation could include "the number of new product ideas" or "new research projects initiated" (Leonard-Barton, 1995 as cited in Zahra & George 2002: 199) and exploitation could be observed by intermediate outputs including "the number of patents" obtained, "new product announcements," or "length of product development cycle" (Zahra & George 2002: 199).

Jansen et al. (2005) agree that the measurements for both potential and realized absorptive capacity should be enhanced. Referring to Zahra and George's (2002) four-dimension model, Jansen et al. (2005) introduce new, multi-level measurements that further clarify the distinctness of each dimension. They suggest that absorptive capacity should be measured through perceptual instruments (i.e. survey mechanisms) and thereby use multiple items that reflect the firm's ability to acquire, assimilate, transform and exploit knowledge as measurements. Jiménez-Barrionuevo, García-Morales and Molina (2009), Camisón and Forés (2010) and Thomas and Wood (2014) measure absorptive capacity along the same line by using multidimensional scale measurements and their results support the studies conducted by Zahra and George (2002) and Jansen et al. (2005). Flatten et al. (2011) also have a similar approach. They measure absorptive capacity by using 14 items that are classified into four dimensions assessing the degree of engagement in acquiring knowledge, assimilation of the acquired knowledge, transformation of the adapted new knowledge and commercial exploitation of the transformed knowledge that creates competitive advantage.

Noblet et al. (2011) aim to operationalize the concept of absorptive capacity. In doing so, they review relevant literature and examine the dimensions introduced by Zahra and George (2002). To develop an instrument for measuring absorptive capacity in companies, they first sort out variables that can be associated with each dimension. External sources background, nature of external knowledge, type of new knowledge, prior investments, prior experience, acquisition of licenses, contractual agreements, alliances and other interrelationships or joint ventures, actors' motivations, organizational culture, common and shared language, R&D intensity, familiarity with organizational problems, personnel turnover, participation in decision-making, ability to detect opportunities in the environment and position of the firm in the network are

grouped as the associated variables for acquisition. Assimilation includes routinization, coordination capacity, personnel turnover, the number of patents pending, the number of research and practice communities and management support. Transformation comprises the development of new products, diversification, routines for knowledge creation and the number of new ideas. Finally, the variables associated with exploitation are the number of patents filed, the number of new products and protection systems. (Noblet et al. 2011.)

The described instruments correspond with Zahra and George's (2002) reconceptualization of absorptive capacity. The measures provide valid and generalized scales for examining the construct (Thomas & Wood 2014). Thomas and Wood (2014) note, however, that there are variations in the number of items, sampled population and focus of questions, which slightly alters the perspective of each study.

2.9. Reactions to Zahra and George's model

Zahra and George (2002) have received both criticism and appraisal for their reconceptualization of absorptive capacity. Zahra and George (2002) have been criticized for defining the construct unclearly and too broadly (Camisón & Forés 2010). According to Wacker (2004), only unambiguous and non-vague terms should be used in formal conceptual definitions. Zahra and George's (2002) model, however, is largely based on an ambiguous concept of complementarity between the four dimensions and the subsets of potential and realized absorptive capacity. Consequently, it can be criticized for not fulfilling the requirements of a proper definition (Camisón & Forés 2010).

Lane et al. (2006) criticize Zahra and George (2002) for their output and input ratio biases when defining absorptive capacity. According to Lane et al. (2006), Zahra and George's view on absorptive capacity is too short-term oriented and that the focus should be more on the importance of preparing a firm for the future. Nonetheless, Lane et al. (2006) agree with Zahra and George that profits are primarily generated through realized absorptive capacity.

Todrova and Durisin (2007) recognize that Zahra and George's (2002) paper raises awareness of the important issues regarding the components, antecedents, contingencies and outcomes of absorptive capacity. However, in their opinion Zahra and George overlook Cohen and Levinthal's (1990) original conceptualization of the construct. According to Todrova and Durisin (2007), Zahra and George should have built their model more systematically on Cohen and Levinthal's study.

Todrova and Durisin (2007) question the very core of Zahra and George's (2002) study: the distinction between potential and realized absorptive capacity. They argue that the new dimension introduced by Zahra and George, knowledge transformation, is actually linked to assimilation as an alternative process and not a following step of the construct. Secondly, Todrova and Durisin (2007) propose changes to the contingency factor of social integration. They suggest that its influence on absorptive capacity may not only be positive but also negative. The third issue that Todrova and Durisin (2007) find in Zahra and George's study is the definition of absorptive capacity as a dynamic capability. According to Todrova and Durisin (2007), Zahra and George fail to truly capture the dynamic and complex nature of construct.

Andersén and Kask (2012) also find Zahra and George's (2002) definition of the construct inadequate and they redefine the original concepts of potential and realized absorptive capacity. In contrast to Zahra and George (2002), who define potential absorptive capacity as the ability to acquire and assimilate knowledge and realized absorptive capacity as the ability to transform and exploit knowledge, Andersén and Kask (2012) argue that all four dimensions can be potential or realized. They criticize Zahra and George's model for confusing potential absorptive capacity with the capacity to actually utilize it. Zahra and George's model does not take the level of utilization of the different capacities into account whereas Andersén and Kask (2012) point out that the levels of potential absorptive capacity and realized absorptive capacity can be significantly different with each other. Andersén and Kask (2012: 43) describe potential absorptive capacity as "the disposed capacity to absorb knowledge" and realized absorptive capacity as "the absorption of knowledge actually performed".

Despite the criticism it has received, Zahra and George's (2002) reconceptualization of absorptive capacity is likely to be the most significant contribution to absorptive capacity research since Cohen and Levinthal's (1990) study "*Absorptive Capacity: A New Perspective on Learning and Innovation*". Dividing absorptive capacity into two large blocks, potential and realized absorptive capacity, makes it easier to analyze the relationship between the different dimensions and study and analyze their antecedents and outcomes (Camisón & Forés 2010). Noblet et al. (2011) similarly state that by drawing attention to the four distinct dimensions of absorptive capacity, Zahra and George (2002) open up many possibilities for examining new areas of the construct and using it in practise.

Engelen et al. (2014) also see the operational possibilities in Zahra and George's (2002) four-dimensional model. According to them, it provides a prominent and comprehensive overview of the steps that underlie absorptive capacity. Engelen et al. (2014) maintain that the four dimensions introduced by Zahra and George (2002) fully cover all aspects of the absorptive capacity process.

Zahra and George (2002) state in the conclusion of their study that future research should recognize the multiple dimensions of absorptive capacity and the links they have to the development and maintenance of a competitive advantage. Now, 14 years after the release of their reconceptualization, it is safe to say that the multi-dimension construct of absorptive capacity has been adapted and accepted by various researchers in the field of management (e.g. van den Bosch et al. 2003; Lane et al. 2006; Volberda et al. 2010). Thomas and Wood (2014: 40) describe Zahra and George's (2002) contribution as a "valuable refinement of Cohen and Levinthal's (1990) initial theorizing by conceptualizing absorptive capacity as a dynamic capability".

3. RESEARCH METHODOLOGY

This chapter presents the methods of the thesis, including data collection, case selection and analysis process. The purpose of this section is to introduce the procedures used to select and use information to achieve the aims of the research. The reliability and validity of the study are also addressed.

3.1. Data collection

The data for the study was collected by using a mixed-method approach. In other words, both quantitative and qualitative methods were applied (Creswell 2009: 203). In quantitative research the aim is to present findings that are objective and can be replicated and generalized (Harwell 2011: 149). In qualitative research, on the other hand, the focus is on understanding meanings and describing and interpreting people's perceptions of their surroundings (Merriam 2009: 13). In this study, the first part of the data collection was conducted as a quantitative survey and the second part as qualitative interviews.

In order to begin the data collection process, the scope of the study had to be defined. Information on the possible companies was acquired through the ORBIS database. By selecting the Finnish food manufacturing companies employing five people or more, a pool of potential companies for the study was formed. Altogether 343 companies were identified.

The next step was to contact the CEOs or other top executives of these companies via phone and ask them to participate in the research by filling out a web questionnaire. The questions of the survey measured absorptive capacity in terms of innovativeness and the success of the company's new products. The respondents were asked to answer the questions on a scale from 1 to 7, "1" meaning "strongly disagree" and "7" meaning "strongly agree". The questionnaire also included questions about the revenue, customer segments and the quantity of different products and services of the company.

We were able to reach 293 of the 343 companies and in the end we received 118 responses to the survey. 98 of the respondents completed the survey fully and included their contact information, corresponding with a response rate of 28.6%. The answers had to be linked with financial data to be considered valid and therefore only the companies with available financial performance data were included in the study.

The data of the 98 surveys was processed by running a cluster analysis. Based on the analysis, companies with distinctly high absorptive capacity were detected. These companies were approached again via phone and they were inquired to confirm that the results seem accurate and asked to be interviewed more thoroughly. All in all, 11 companies with above average absorptive capacity were visited for a face-to-face interview.

The interviews were semi-structured. In other words, the overall structure, themes and questions were planned before hand but the flow of the discussion was allowed to influence the course of the interview (Saunders, Lewis & Thornhill 2009: 320). Although the order of the questions was predefined, some variation occurred and new questions that came up during the interviews were also asked. The general procedure, however, was the same for all interviews. The main focus of the questions was on absorptive capacity and the average length of an interview was approximately one and a half hours. Two people from each company were interviewed to ensure that a comprehensive and accurate assessment of the company's processes could be made.

First, some basic information of the interviewee was gathered, such as name, occupation and their history in the company. Then, the interviewee was asked about the company in general. The questions were for example about what kind of products the company offers, what the customers are like and where the biggest costs come from. The second topic was about the resources and capabilities of the company. The final, and the most significant, part of the study was about the company's processes of acquisition, assimilation, transformation and exploitation of knowledge in the past, present and future.

The aim of the interviews was to acquire information about absorptive capacity in practice. The questions were set in a simple way so that the interviewee did not have to have previous knowledge of absorptive capacity in order to be able to answer. By grounding the questions on real-life experiences instead of theoretical concepts, the mutual understanding between the interviewer and the interviewee is strengthened (Saunders et al. 2009: 332). For instance, one of the questions regarding the assimilation of knowledge was about where the people in the company discuss new ideas. The questions also concerned the innovativeness, success and novelty of the new products. The interviews were recorded on audiotape and afterwards transcribed by professionals.

3.2. Case selection

As mentioned before, the case selection is based on the quantitative data gained from the questionnaires and financial data available in the secondary database, ORBIS. After combining the datasets, a cluster analysis was conducted. The analysis revealed clusters of companies with different levels of absorptive capacity. This study focuses on the group of companies with above average values of absorptive capacity.

This study presents and analyzes five of those companies: an industrial meat company, a coffee roastery, a pet food company, a bakery and a traditional meat company. The systematic methods of data collection and sample selection ensure the appropriateness of the case examples for the purposes of this study. Examining these companies is expected to provide a comprehensive perspective of absorptive capacity practices in the context of the Finnish food manufacturing industry. The aim is to uncover the microfoundations that underlie high absorptive capacity.

3.3. Analysis process

Analyzing the material is based on the four dimensions of absorptive capacity defined by Zahra and George (2002) and the study builds upon their idea that absorptive capacity is a dynamic capability that exists in two separate subsets, potential and realized absorptive capacity. The theory chapter serves as a foundation for the empirical analysis process. The study aims to continue Lewin et al.'s (2011) work by examining

and identifying the metaroutines and practiced routines behind high absorptive capacity and thereby operationalizing the construct.

3.4. Reliability and validity

The study has some limitations. Reliability refers to the consistency and stability of the responses while validity describes how accurately the study represents the phenomenon it measures (Creswell 2009: 190; Gibbs 2007: 152). Because the empirical part focuses on companies in the Finnish food manufacturing industry, the results may not apply to other cultures, countries or industries. The results are representative of a mature, low-technology industry in a specific geographical location. Moreover, the study mainly includes small and medium-sized enterprises and 63.60% of them are family owned, which may affect the generalisability of the findings.

Another limitation of the study is that the questionnaires and interviews were directed to people at high positions in the companies, such as marketing managers and CEOs, which means that absorptive capacity is viewed from their perspective over those at other levels of the organization. Response bias was reduced by ensuring complete confidentiality for the participants but a possibility of it cannot be totally ruled out. The data was collected in 2013–2014 and thereby the study is essentially a representation of that period of time.

In this study, absorptive capacity is measured by using carefully chosen measurement questions both in the initial survey and in the follow-up interviews. The questions were constructed based on existing literature on absorptive capacity to ensure that the respondents provided answers that reflected the absorptive capacity processes of their companies. Each dimension of absorptive capacity was measured separately by asking a set of 12 to 15 questions on each of them. By increasing the number of relevant questions, the measurement error can be decreased (de Leeuw, Hox, Dillman 2008: 401).

4. RESULTS

This chapter presents the empirical findings of the study. First, the five case companies are introduced and their competitiveness is briefly described. The within-case analysis is followed by a cross-case analysis. It examines the processes of knowledge acquisition, assimilation, transformation and exploitation in the case companies and connects the practiced routines with superior firm performance.

The dimensions of absorptive capacity are analyzed in the order of their occurrence. Thereby the developmental nature of innovation work is accentuated. Similarities in the case companies' values and actions suggest that there are indeed factors that enhance absorptive capacity. These factors contribute to practices that comprise the microfoundations of absorptive capacity.

4.1. Case description and within-case analysis

The case companies of the study are described in this chapter. Each case is explored separately before advancing to the cross-case analysis in chapter 4.2. The purpose of this chapter is to build a general understanding of the case companies, their offering and their business models.

4.1.1. Industrial Meat Company

The company manufactures sausages and is specialized in cold smoked products and different types of salami. Its products can be purchased in nearly all Finnish grocery stores and the company also has a strong presence in the Swedish market through a local grocery store chain. With over 70 years of experience, the company has gained a reputation as a reliable operator. Even though its traditional products remain most popular, new products are constantly developed according to changing customer needs. Streamlining the production, successful specialization and outsourcing have enhanced the company's market position.

4.1.2. Coffee Roastery

The company started off as a simple coffee roastery but has since expanded its business to include the retail, renting, maintenance and cleaning of coffee machines, an online shop and a cafe. The focus, however, remains on roasting coffee, and other functions are mainly outsourced. The company has excellent networking skills and relies heavily on co-operation. With well-established relations to global coffee bean suppliers, the quality of the products is ensured. The company has also gained valuable experience by working together with HORECA customers. Moreover, information and ideas are gained and exchanged through a global coffee roastery network. The main goal of the company is to offer authentic coffee experiences with coffee that makes an impression.

4.1.3. Pet Food Company

The company specializes in frozen raw food for dogs. In 2014 its products were available in pet specialty chains in Finland and Sweden. The typical end-customers are dog owners who appreciate organic food and want to feed natural food to their pets as well. The company uses social media to maintain a close relationship with the customers and offers guidance regarding raw feeding free of charge. Product development and co-operation with experts and dog owners play an important role for the company. Focusing on a niche market and the rising interest in unprocessed foods have led to the success and growth of the business.

4.1.4. Bakery

The company offers additive free baked goods, including gluten free products. The sales network stretches from Helsinki to Kokkola and the products are sold in all the main grocery store chains as well as the company's three own bakery shops. The company is profiled as a local bakery and wants to stay close to the customer. It offers fast delivery on its own transport vehicles and puts emphasis is on providing fresh, healthy and tasty products. The bakery even has a "freshness guarantee", meaning that they provide fresh bread to their customers six days a week and give them an option to get a refund for the unsold quantity. Experimentation and innovation is enabled by the company's own

bakery shops. In the shops, new products can be sold directly to the end-customers and their feedback determines whether or not to proceed with the product.

4.1.5. Traditional Meat Company

The company operates in meat wholesales and offers both raw and cooked meat products for the Horeca sector and the private sector. Above all, the company wants to be known for its quality meat. In addition to cured meat products, the company offers meat curing services. The strength of the company lies in its close-knit organizational structure, which enables efficient communication and knowledge sharing. The products are sold in the company's own shops and through two main grocery store chains in the Jyväskylä region. The company sees profit potential in putting more focus on its own sales channels and is planning to invest in a vendor truck.

4.2. Cross-case analysis

The cross-case analysis focuses on examining and comparing the chosen case companies. The emphasis is on the microfoundations of absorptive capacity and summarizing empirical evidence of the practiced routines that build a firm's absorptive capacity. The analysis adapts Zahra and George's (2002) approach to absorptive capacity and each of the dimensions are discussed separately with references to the case data.

4.2.1. Knowledge acquisition

Knowledge acquisition includes practices for identifying and recognizing the value of outside knowledge (Lewin et al. 2011). Acquiring knowledge begins by defining where the ideas come from. The case companies demonstrate various ways of collecting information that helps them to build their knowledge and develop their innovation skills.

Based on the interview data, customers are an important source of ideas and innovations. The ideas are acquired by collecting feedback directly from customers and indirectly for example via sales representatives. Some customers are active in giving

ideas and products can be developed exclusively for their special needs. In order to enable efficient knowledge acquisition, companies need to interact with the customers and build a close relationship with them. If a customer makes a wish or a request, it should be taken into account. In addition to personal encounters, feedback and ideas can be received through email, phone and the company's own website and social media accounts.

Bakery: The most important thing, which can never be lost, is to have a customer oriented approach.

Coffee Roastery: Usually the ideas emerge when a salesman says: "Hey, I have customers who are interested in this and this". [...] Then there is already demand for the product and we know that there are a few customers who will want to buy it immediately.

Traditional Meat Company: For example before summer, restaurants ask for different types of sausages, sausage flavors, spiced frankfurters and meat products for their summer menus.

The case data reveals that in addition to keeping an open dialogue with the customers, outside information can be gathered through industry magazines and fairs. Travelling is seen as a way of gaining valuable insight and new perspectives. The case companies state that information can come from other stakeholders as well, such as suppliers and vendors, and maintaining friendly relations ensures that useful information can be received from them.

Industrial Meat Company: We mention in our long term plans and in our strategy that ideas for new products have to be constantly looked for and found. We visit fairs all over the world, challenge our customers and we have active sales representatives who visit stores [...], we hear many thoughts and ideas from them. We also get ideas inside the company based on own experiences.

Following the media and current trends is crucial for keeping up with changing customer demands. For example discussions about food additives gave the industrial meat company an idea to develop an additive free sausage. Consumer surveys can also be used to assess the current mindsets of the target audiences. Although the case companies scan their environment for new ideas, competitors are not mentioned in the discussion of the primary sources of new knowledge. The focus is on the companies' own strategy and little attention is given to the rivals. Imitation is not used as a means for creating new products.

Industrial Meat Company: Each of us actively follows the discussion around the food industry and of course our suppliers provide a lot of information as well as our customers, fairs, industry magazines [...].

Analyzing the business environment and spotting the gaps in the market is an effective way of getting ideas for new products. The analysis is not necessarily a systematic process but is rather done on an everyday basis. Everyone in the company keeps their "eyes and ears open" and ideas can arise for example during coffee break conversations. Specific meetings for brainstorming are not common amongst the case companies yet but are mentioned as possible future methods.

Pet Food Company: Another important thing is that we try to actively keep up with the general discussion on internet forums, social media and so on. We take ideas from there that might not even be directly targeted to us.

Bakery: [Ideas arise from] basically everything that you see and hear. You can get them from magazines, social media, friends and customer requests. A supplier may inform about a new raw material or a technique and we can also turn to some service provider and order [information] from them.

Coffee Roastery: Some [ideas] arise by following what is done in other parts of the world. The specialty coffee industry is so much more developed outside Finland. Ever since the beginning we have also listened to the customer very

closely and provided them the things they want. Maybe now we are also mature enough to come up with ideas ourselves.

The main resources for knowledge acquisition are the people who work for the company. Individuals may hold specialized knowledge that ought to be utilized for the company's benefit. However, the case companies do not have rewards systems for knowledge acquisition purposes. The data indicates that an open organizational culture and passion motivates employees to search for ideas independently and other incentives are not needed.

Pet Food Company: We believe that we all have big desire to change the dog food business and that is enough.

Traditional Meat Company: Ideas come equally from all over the organization. Often the ideas are sort of like home cooking experiments and that way good combinations are discovered.

Coffee Roastery: It [knowledge acquisition] probably happens through passion. Now that we have new projects, we try to pick the kind of people to the project teams who are interested and excited about certain topics and thereby [working] would come naturally to them.

4.2.2. Knowledge assimilation

The knowledge assimilation routines of the case companies are closely connected with the knowledge acquisition practices. The assimilation begins by sharing the acquired knowledge within the organization. The data shows that an open organizational culture enhances the assimilation process because it allows knowledge to flow freely between different members of the organization. Ideas receive proper attention and product development is constantly in discussion on all levels of the organization. For knowledge assimilation to work, information about new ideas needs to especially reach the managers for they are the ones who initiate action and make the final decisions about product launches.

Pet Food Company: If we stop improving the processes and quit discussing about what goes wrong and what goes well, [...] then the whole communication gets blocked.

Traditional Meat Company: Basically everyone [in the company] knows about the things we are starting to work on and everyone's opinions are heard.

To ensure the efficient flow of information, ideas are constantly discussed informally in the case companies. Coffee breaks and other everyday social interactions among firm members are seen as fruitful ground for both knowledge acquisition and knowledge assimilation. In addition to person-to-person interaction, ideas can also be shared formally with product development suggestion forms. When ideas are systematically collected, the right people are automatically informed about them and the ideas can be evaluated immediately. The case companies indicate an ambition towards a more organized approach but at the same time feel that reading through suggestions can become a burden. The risk with gathering ideas unsystematically through informal discussions on the other hand is that some of them may become forgotten. However, it is also noted that although all ideas are not marked down, the best ones stay in mind. In addition to sensitivity to suggestions, flexibility of the organization ensures that the ideas move forward.

Industrial Meat Company: With [the product development suggestion form], you will be guaranteed to get the idea into discussion. [...] Usually, however, when a lot of people notice that "here's a good idea", things start to move on their own. Then we can do the bureaucracy afterwards.

Coffee Roastery: [Sharing knowledge] has always depended on how enthusiastic the first person is and for how long they care to push [the idea] forward. My goal, however, is to make this a lot more systematic.

Pet Food Company: [Ideas are shared around the coffee table] as well but we have been trying to make things clearer by documenting ideas and putting them

through a product development process, so that the same ideas do not come up two or three times.

Bakery: We thought about writing the ideas down, but no. Who has the energy to read them from there?

Passionate employees are mentioned as the number one resource of the companies. Unity and team spirit are the driving forces behind the case companies' innovation and experienced individuals can also transfer their know-how to others through teaching. In an open organizational culture all ideas are welcomed. The case companies suspect that encouraging and supporting the members of the organizations has a great impact on how actively new ideas are received from them. It also ensures that ideas are not left unsaid because of the fear of rejection or the lack of motivation. This is in line with the findings of Chalmers and Balan-Vnuk (2012), who name empowerment and openness as the main factors for acquiring new knowledge from the external environment as well as sharing knowledge inside the firm.

Traditional Meat Company: We have a good group of people working here and it is not like some big firms which are seriously compartmentalized. Here everyone can play jokes on one another.

Industrial Meat Company: I will put it this way: you are always allowed to make a suggestion. It is not restricted in any way.

Pet Food Company: [...] if someone with a lot of information loses motivation, the information is left behind and it cannot be retrieved.

Coffee Roastery: Our people put their hearts into this and if we lose that because of bureaucracy, then we lose everything.

The efficiency of the knowledge assimilation processes is explained with a low hierarchy working culture, which helps in getting information through to the management. Because of the case companies' small size, the working units are dynamic

and there is plenty of interaction among all firm members. People working in production may be apart from the rest of the firm members but collective meetings on a regular basis help to decrease the gap. Another way to improve knowledge sharing from one team to another is to have a link between them: someone who listens to what everyone has to say and carries the messages forward. New ideas are mainly reviewed among the executive committee but the whole organization is involved in the discussion about new products.

Coffee Roastery: We have always had some connecting link between [different departments] and we have discussed if there is something that the sales department should know or if there is something that the production team should be informed about. That way we have been able to reduce the gap between them.

The case data also suggests that knowledge assimilation is influenced by the applied leadership style. The case companies are unanimous about the CEO having a great impact on the organizational culture and thereby the motivation of the employees. The cases show that knowledge sharing can be improved with a change of manager, which proves that leadership can have a major effect on innovative performance. This is in line with Noblet et al. (2011), who state that companies whose leaders are most open tend to have a stronger absorptive capacity. If the custom is that the CEO makes all the decisions alone and does not incorporate employees in the product development process, it is likely that the employees will not share their knowledge. The current managers of the case companies are genuinely interested in the employees' ideas and take their opinions into account when making the final decisions.

Traditional Meat Company: It is the atmosphere [that has changed]. Let's say, that the previous owner represented the old leadership style, meaning that he just gave orders. You were supposed to do your job and nothing extra.

Industrial Meat Company: [The new CEO] brought new winds and we realized that we should start using our resources more and allocate them differently or at least think about things from different perspectives.

Bakery: The bakers may do new things completely independently and we do not even know that they have invented something. They are very autonomous and it is not necessarily required for them to tell what they are doing, it is ok to try.

Coffee Roastery: The leadership is very soft here and if someone has an idea, it is easy to get executed. There is no bureaucracy to get good ideas approved, you can just go ahead.

According to the case data, knowledge assimilation requires everyone in the organization to be aware of whom to inform about new ideas and through which channel. If a sales person hears about an idea, they can share it with a divisional manager for example who then passes it on to the CEO. New ideas are not put into practice before getting permission from the CEO or other higher level manager. In addition to person-to-person communication, the previously mentioned product development suggestion forms serve the same purpose. Knowledge sharing is further enhanced by holding meetings on a regular basis or whenever needed. After each meeting, a memo of the main topics can be composed so that information can also be shared with those unable to attend. Information boards can also be used for knowledge sharing. By locating them in a common area, all the employees can read the latest news from there.

Industrial Meat Company: We have increased the amount of necessary meetings where the key personnel from different departments is present and in addition, we have vertical team meetings where we go through the main topics of the week or of the day.

Industrial Meat Company: We have tried to lose a certain type of formality, like “now we have a meeting and these are the things you should know”. Instead, we let things flow on their own.

Bakery: [Meetings] do not proceed according to a formal agenda and we do not hit the table with a gavel.

The case data shows that as companies grow, the distance between the members of the organization becomes greater. The case companies see it as a challenge for knowledge sharing. With everyone not physically in the same location anymore and face-to-face communication decreasing, the importance of email, cloud storage services and networking sites increases. Growth may require new guidelines and a more structured approach to assimilating knowledge but the case companies maintain that a conversational atmosphere is not to be lost.

Traditional Meat Company: We are a small company so here everyone is able to discuss things and share ideas about what to do.

Pet Food Company: Before [sharing knowledge] was easier because everyone was around the same coffee table [...]. Now we are growing, which of course makes things more difficult.

4.2.3. Knowledge transformation

Knowledge transformation marks a line between potential absorptive capacity and realized absorptive capacity. While the processes related to knowledge acquisition and assimilation involve collecting and sharing new ideas, knowledge transformation begins the actual practical execution of those ideas. It requires different skills than knowledge acquisition and assimilation.

First and foremost, the case companies rely on their own vision and experience when transforming the acquired and assimilated knowledge. The case companies demonstrate confidence in their abilities to combine the acquired knowledge with the existing knowledge base. New products are created largely based on the company's own taste and employees are involved in testing the products before they are offered to customers. In addition to "gut feeling", the case companies use estimates based on previous years to determine the production costs, volume, partners and value to customer. In order to be able to make evaluations based on facts, there has to be a record of sales and calculations about material costs and other expenses.

Pet Food Company: [Estimates on production costs] are made with theoretical calculations per product, which includes raw material costs, approximate labor costs and so on.

Coffee Roastery: It is the gut feeling. Of course we always have some numbers but we make guesstimations, execute and after that see what we have done.

Traditional Meat Company: We work together. We taste the new product together and everyone gives their opinion and suggestions on what to add or change about it.

Bakery: We just try it.

Like in the acquisition and assimilation of knowledge, networks and relationships are important in the transformation of knowledge. Co-operation with customers is a way of transforming knowledge as products can be further improved with customer feedback. Key customers may provide valuable and honest opinions about the products, which can be utilized in the product development process. In addition to gaining insight about possible product improvements, maintaining good relations with partners and customers allows companies to get quick help to emerging issues. The case companies are aware of the operators that are relevant to their businesses and utilize their know-how when needed. Companies can also learn from related markets: for example the pet food company is interested in the production machines that are used for making human food.

Coffee Roastery: Certain customers can tell us that “hey, we think this roast is too sour” or so on. They give us very valuable feedback.

Industrial Meat Company: [The applicable partners] are known and our people are aware of who to ask about things. [...] the customer relationships are in a good state and we can just pick up the phone and ask about a certain packaging material for example.

Pet Food Company: Between us and the consumer there is always a retailer, which is the most important partner. Also, because our business is founded on transparency and openness about raw materials, our raw material suppliers are close partners to us.

Test rounds are a typical part of knowledge transformation for the case companies. The bakery, for instance, avails its shops in the product development process. The company is able to test their new products by offering samples to customers who come in and get instant feedback from them. Based on how well the test batch sells, the company can make decisions about future volumes. By starting small, risks are reduced. Failed products can quickly be removed from the selection. The data indicates that avoiding rigidness and bureaucracy in decision making enables successful knowledge transformation and fast moves.

Bakery: After the product has been made, samples have been given out and maybe the product has even been sold in our own shop, we can see quite quickly whether or not people are interested in it and if it is worth to take it to the grocery stores or not.

Coffee Roastery: We have a very fast tempo when it comes to new coffee. We invent it, we make it and we taste it. If we think it is good, we do not really make double checks. We rather make a mistake and then make changes instead of being extra careful with everything.

Traditional Meat Company: When we develop a new product, we make a prototype of it and bring it to the customer in person [...] and the customer gets to taste and test the product.

According to the case companies, meeting the customer's expectations is one of the main requirements of a competitive product. Preferences can change with time, which requires companies to stay alert and follow ongoing discussions. Even traditionally successful products may suddenly become less popular. For example, the traditional meat company started getting feedback about their old-fashioned smoked ham tasting

“too smoky”. As a result, the company developed a lightly smoked version of the original product, which instantly became a new favorite. Similarly, the industrial meat company took out the monosodium glutamate from their product after the use of the additive was under a debate in Finland. The examples show that it is crucial to react fast to feedback received from the customers and be willing to make even big changes.

Pet Food Company: You just have to remain open and bravely accept [ideas] and think about new things. Always when dealing with customers, ideas may arise quite suddenly.

The preferences may vary significantly from region to region. The case companies are sensitive to see what works where. They utilize their partners’ knowledge about what the product has to be like in order to succeed in a certain location. Marketing strategy can also be divided into smaller sections to improve its efficiency. Also, the visual aspect of the product needs to be taken into account. An attractive package is seen to have a great impact on the decision to buy the product.

The case companies believe that the success of a new product can never be fully ensured by calculations but a systematic preparation could decrease the risks. The practical tasks related to creating a new product are well-established in the case companies and mistakes in that department are rarely done. Although sometimes even big decisions are based on intuition, the case companies have yet to experience any disasters. However, there is an aim to increase documentation and verification to ensure that failures can be avoided in the future as well. Each department can make their own risk analyses which are then combined and evaluated as a whole. Even with more procedures, the case companies do not want lose the speed in knowledge transformation.

Coffee Roastery: I hope that in the midst of growth we will also have time to evaluate the situation and make plans based on the evaluations. We should make some tests in between and see, how it is going, collect results and review the situation again, in case something should be adjusted.

Pet Food Company: [Knowledge transformation practices] have change in a way that they have been made clearer and we continue to make them clearer, so things get done in a more organized manner.

Bakery: Our actions will remain fast in the future as well, because you can never be sure about everything beforehand.

The case companies believe that the reason they have managed to make the right decisions even without extensive research is their past experience and accumulated knowledge of the field. The data reveals that the investigation on production methods begins precisely by knowing the industry. The raw material costs and possible selling prices are defined and do not require a lot of extra research with every new product. If something is unclear, partners can be consulted.

The production team evaluates whether or not the product is possible to execute and the people in charge of sales and marketing gather customer feedback to assess interest towards the new product. Feedback can be received through any type of interaction with the customer, for example at the company's own store. By outsourcing some activities, more resources are left for working with ideas and product development. The executives are involved in the check routines and make the final decisions. However, decisions are discussed in the organization instead of granting full autonomy of the CEO. A conversational atmosphere is an integral part of knowledge exploitation in the case companies as it is of the other dimensions of absorptive capacity.

Industrial Meat Company: We are actually quite a dynamic company [...]. With the central team that we have here, we are able to focus on the essential things and we have outsourced a lot of activities.

Coffee Roastery: [The CEO] has embraced the conversational culture and decisions are not made in a dictator-like way. Usually all parties are listened to and things are discussed inside the company [...] and it is decided together that "this is good". However, [the CEO] is the one with the ultimate veto power.

All the case companies have a clear focus in their strategy: the bakery concentrates on additive free products, the coffee roastery emphasizes the craftsmanship and quality of the coffee and the industrial meat company is experienced with cold smoking, the traditional meat company with meat curing and the pet food company with biologically appropriate raw food. According to the case data, the focus and an agile organizational structure combined helps with the product development process and use the acquired and assimilated knowledge in the most appropriate way. It also enables the companies to concentrate on their own strengths instead of imitating what competitors are doing.

Traditional Meat Company: I think that it is the other way around that the big competitors are copying us because we are able to make decisions regarding a new product in a day whereas in a large meat company, it takes months.

Industrial Meat Company: It is the unique taste of our products, which is extremely difficult to imitate. I think that it is the main thing that our competitors would like to get from us.

4.2.4. Knowledge exploitation

Knowledge exploitation is a continuum to knowledge transformation. The new product is finished based on the tests and evaluations that are performed when transforming the acquired and assimilated knowledge. The CEO or the executive committee decides on the commercialization of the product.

Experimenting and taking chances are characteristic to the case companies. It does not take long for a new product to be on the market. Only the industrial meat company indicates a slightly reserved approach towards taking risks. It may result from the nature of the business. With cold-smoked meat, there are long preservation tests that take place before the product can be put into the market. It allows the company to go through things many times before the actual launch of a new product. However, the company notes that the process can be speeded up if needed.

Bakery: Today we think about it and do it. Tomorrow it is on sale.

Traditional Meat Company: We do not perform any specific investigations [on the competitiveness of the product]. Instead, we make the product and believe in it. [...] We believe that it will succeed and if not, we remove it from the collection.

The companies rely on the skills of their sales personnel to get the information about new products to the customers. The salesmen contact and visit the customers and present the finished products to them. Being active and taking care of customer relations are seen to improve the effectiveness of the sales and thereby the exploitation of knowledge.

Bakery: We have a personal representative who visits every store every single day: the bread deliverer.

Industrial Meat Company: Thanks to efficient field sales we can see how the product works in practice and how it circulates. If we get good experiences, we can possibly expand the selection on a national level.

Pet Food Company: We have campaigns, visit customers and call them. We have a good understanding of how to talk to resellers, what is the situation and so forth.

Coffee Roastery: When we have a new product, [our sales personnel] communicates about it to the customers. They know almost right away, which customers might be interested in it.

To ensure that the consumers find the new products, various marketing methods can be applied. Firstly, the product is introduced and promoted in the case companies' own websites and social media channels. Social media enables interaction and thereby helps to spread the word about new products. When consumers see a product they like on social media, they may begin to operate as sales agents of sorts and put pressure on the retailers to include the product to their line of items. Combined with the company's own sales efforts, the information reaches the potential resellers.

Pet Food Company: Before social media we did not think about the end-customers that much.

Traditional Meat Company: I think that social media is something that will be a part of the future.

Another way the case companies use to get the end-customer's attention is through in-store brand visibility. It can be done with product stands, banners and other displays both at retailer locations and at the company's own shops. Information can also be shared via blog posts and monthly e-newsletters. Traditional media outlets such as TV, radio and newspapers are of lesser importance. The main barrier to extensive traditional marketing is the high price. Without the resources to execute nationwide campaigns, social media and the sales personnel's skills are emphasized. Regardless of the scarce resources, the case companies are confident that with their products in question, massive marketing is not needed to assure sales.

Industrial Meat Company: It is not possible for us to do any large-scale launching campaigns. Perhaps the main thing for us is the visibility at the store shelves. [...] we are a small operator so we have limited resources to be used for marketing.

The data shows that small company size provides certain benefits in terms of knowledge exploitation. Similarly to the findings by Daghfous (2004), the data indicates that the small size of the case companies enhances innovativeness. While the large competitors may have to move according to certain steps and carry out national marketing campaigns for their new products, the case companies are able to bring new products to the market without rigid launching processes. The case companies find agility an asset but at the same time they show an interest in more standardized commercialization practices. A more careful launching process is seen as a way to make the right decisions regarding brand image and overall company strategy. The case companies balance between intuitive decision making and calculations.

Pet Food Company: Now we have to go through everything, what is the language, the tone, how to say things and of course all the necessary information and usability [of the product]. All of that takes more time, which is a good thing because it gives us the opportunity to think about things for the second and for the third time, is it a smart launch or not.

Coffee Roastery: [My co-worker] and I sit on the etiquettes and launching materials so firmly, that it is impossible to take [products] anywhere before we think that it is okay to publish them. [...] now we have control over it, which is good.

The companies face some bureaucracy when dealing with large customers such as grocery market chains, who have their own timetables with new products. It requires the companies to plan ahead and coordinate operations which may be challenging. Working with retailers is also affected by personal chemistry. To get the products to the consumers, the companies need to impress the store managers first. The traditional meat company sees a solution to the issue in decreasing the links in the supply chain and selling the products only through the company's own channels. In addition to its own shops, the company plans to invest in a vendor truck to increase customer proximity even more.

Traditional Meat Company: It is up to the store and depends on the mood, whether the division manager has had a good night's sleep or not. If they say 'no', then it is a no from the consumers as well. We have noticed that consumers would like our products but we just cannot get them for sale.

Bakery: The consumer wants freshness [...]. Well, the selection manager usually only wants to drag the price down.

In addition to practices like testing the markets, getting the products to the right retailers and maximizing the profits, success is dependent on coincidence and luck. Therefore the case companies find it is necessary to stay flexible. After the product launch has been completed and new products have been sold, the case companies start monitoring the

sales. Based on the experiences, production volumes can be increased or decreased. If a new product succeeds better than expected, the company needs to be able to quickly react to the large demand. If the product is too innovative, it may not succeed as predicted and needs to be taken off the market. Sometimes, however, products that are meant to be seasonal prove to be hits and are then added to the permanent selection. The case companies are sensitive to signals about what works and what does not and adjust their operations accordingly. The case companies that have their own shops maintain that the shops further enhance flexibility.

Coffee Roastery: [...] this [coffee blend] was supposed to be a seasonal product. Then it turned out to be very popular. Well, let's add it to our permanent product line! Everyone loved it and the demand continues. Of course it could have gone the other way around as well. If people would not have liked it, we would have taken it off the market in all quietness.

Bakery: Our own shops are very important [...] for cash flow, profit, customer interface, product development, experiments and everything.

None of the case companies primarily compete with price. Instead, the competitiveness of the product lies in its quality and uniqueness. The brand aspect is becoming increasingly important for the companies, which is taken into consideration in the exploitation of knowledge. An underlying factor in knowledge exploitation is motivation and willingness to grow. Determination pushes the case companies forward and drives the commercialization of new products.

Pet Food Company: [Before] we were not as strict with the brand, it was just a white label with the necessary product information and then it was off to the store.

Traditional Meat Company: We have a good story and we believe in it and stand firmly behind it. In the fall we will renew our brand a little bit and clarify our main messages and so on.

Coffee Roastery: [Our competitive advantage] is dependent on our product. It really differs [from other products] and if you put it next to a coffee made by another Finnish coffee producer, you can actually taste the difference.

Industrial Meat Company: We have a constant desire to improve and take the market of cold smoked meat forward. It is certainly one of the biggest factors in this whole thing. The fact that we refer to us as the masters of cold smoked product obligates us to be forerunners in that sector and market.

Bakery: We come, we challenge, and we are not as good as the other players in the field. How can we win? We do not win in skill or anything else. We just have to have the will, the motivation, and the urge to grow.

5. SUMMARY AND CONCLUSIONS

This chapter presents the theoretical contributions of the study and summarizes the main findings. Managerial implications are also discussed and evaluated. Finally, the chapter examines the limitations and provides suggestions for future research.

5.1. Theoretical contributions

Building on existing theories of absorptive capacity presented in chapter 2, this study contributes to the research of the microfoundations of absorptive capacity by analyzing the routines for knowledge acquisition, assimilation, transformation, and exploitation. With empirical data from five case companies with high levels of absorptive capacity, the practices and principles that build a firm's absorptive capacity can be detected and evaluated. The analysis shows that there are numerous factors, both organizational and personal, which affect the efficiency and effectiveness of the company's capabilities to acquire, assimilate, transform and exploit knowledge. By identifying the microfoundations that underpin the superior firm performance, this study explains how companies can improve their absorptive capacity.

Small company size seems to support absorptive capacity. Based on the cluster analysis that was performed, it is the small companies that demonstrate above average absorptive capacity. The interview data from the case companies reveals that small company size enables flexibility and fast reactions to new ideas. It also facilitates direct communication and the flow of knowledge. In the case companies the employees are aware of who to inform regarding new ideas and through which channel. The information reaches the right people fast, allowing the companies to proceed with the ideas. In large organization there are presumably more communication barriers and hierarchy. Thereby company size is connected to organizational relationships, especially within the firm, and practices of knowledge management. The analysis indicates that low hierarchy and open communication enhance potential absorptive capacity in particular. The case companies believe that when the organizational culture is easygoing, the employees are more comfortable in sharing their own thoughts and ideas with others.

The case companies are committed to constant research and product development. Innovations are driven by the case companies' organizational culture and ideas are informally discussed on an everyday basis. The case companies do not use reward systems to boost innovation. The strength lies in passionate employees who are self-motivated to search for new ideas, share them with others and execute them. Encouragement, team spirit and short distances between people enhance the innovation practices. The firm members' positive attitude and passion towards work supports potential absorptive capacity as well as realized absorptive capacity. Above all, dedication helps to ensure that developing new products is carried out commercially.

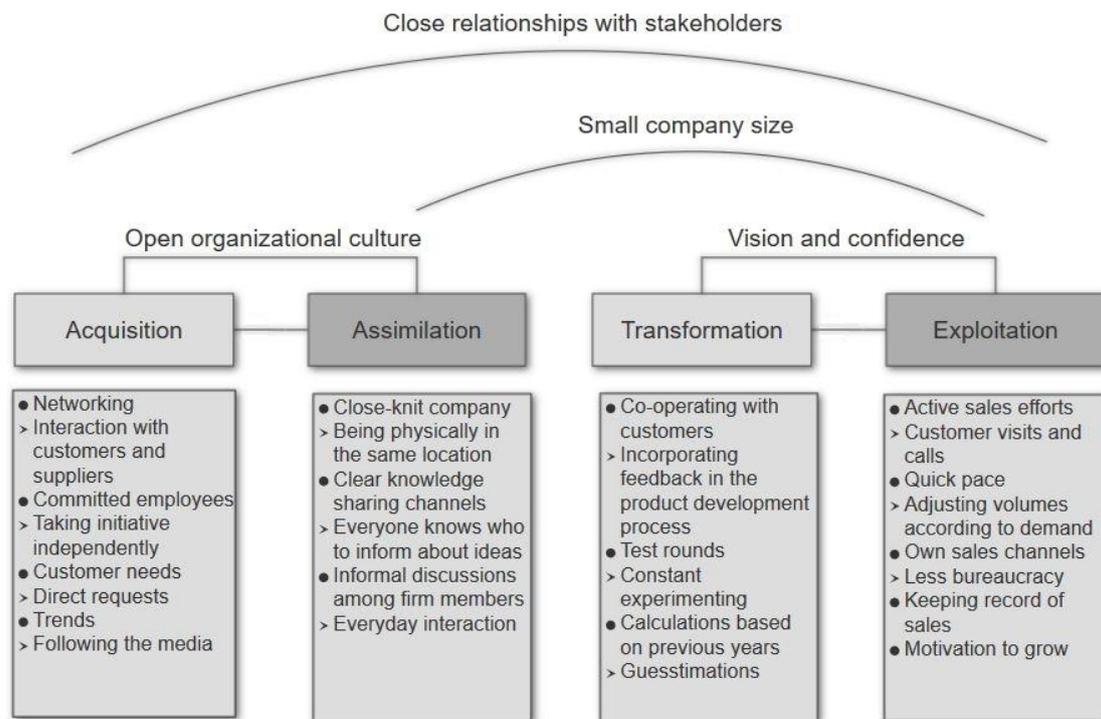


Figure 2. Microfoundations of absorptive capacity.

Figure 2 shows the main practices underlying high absorptive capacity. In knowledge acquisition, companies benefit from a close-knit organizational structure and direct communication. All the members of the company are involved in the process of generating new ideas and the company atmosphere is engaging and collaborative. Companies get ideas from employees' own experiences as well as ongoing trends. Communication with external parties is also valued because ideas are often received

through stakeholders such as suppliers and customers. Active networking can bring new knowledge into the organization.

Knowledge assimilation is enhanced in the case companies namely because of small company size. Everyone in the organization knows who to inform about new ideas and there is lots of interaction between the firm members. Efficient communication ensures that ideas are addressed and responded to. Being physically in the same facilities supports knowledge assimilation. As firm size grows and the distance between the people becomes greater, the efficiency of knowledge sharing can suffer. The case companies emphasize the importance of informal interaction and everyday discussions in the assimilation of knowledge.

Knowledge transformation is a process largely based on experience and gut feeling. Although some calculations can be made to estimate demand, decisions are often guided by vision, intuition and guesstimations. Alongside confidence, a focused mission and strategy facilitate the transformation of knowledge. By co-operating with customers and other external stakeholders, companies can receive useful information for knowledge transformation purposes. Samples and test rounds enables the companies to refine the new products. With agility, products can be adjusted according to the reactions they receive.

In knowledge exploitation, the emphasis is on active sales efforts. Maintaining close relationships with customers appears to have a positive effect on the reception of new products. Social media is a useful marketing tool because it enables interaction with the customers at zero or low cost. An agile organization ensures that product volumes can quickly be adjusted according to demand, and monitoring the market and keeping record of sales helps in predicting how to proceed with the products. By relying on the company's own sales channels, rigidity caused by bureaucracy can be minimized. Above all, motivation and passion are the forces behind successful knowledge exploitation.

5.2. Managerial implications

The findings of the study indicate several managerial implications that can be used to strengthen a company's absorptive capacity from the microfoundation perspective. First of all, the case companies rely on low hierarchy and soft leadership. Informal interaction among the firm members supports the development of an open organizational culture. By keeping the hierarchy at a minimum, unnecessary bureaucratic steps can be avoided and operational effectiveness increased.

Another managerial practice that seems to have a positive impact on firm performance is to trust the employees and give them freedom to express themselves. When employees are allowed to explore and experiment, innovation takes place. Involving everyone in the product development process enhances team spirit and boosts motivation. In a supporting environment the whole process from knowledge acquisition to knowledge exploitation becomes more transparent and facile.

Managers should also foster relationships with other stakeholders such as customers and suppliers. Interpersonal skills help when negotiating with retailer managers as well as in daily encounters with the deliverers of raw material for example. As stated before, networking may bring valuable information to the company, and opportunities to get new ideas from external parties should never be neglected.

It is important for managers to ensure effective and efficient internal communication. The case companies benefit from their small size in this matter because it enables continuous interaction among firm members. Managers can support knowledge transfer by assigning regular meetings and creating systematic idea collection methods. To make sure that the company is able to move quickly, there should be a clear protocol for how to proceed with new ideas.

Above all, the managers of the case companies demonstrate confidence and passion. It shows in the willingness to take risks and in making decisions based on gut feeling. Communicating the vision to the whole organization assures that everyone works for the same goals.

5.3. Limitations and future research

The results of this study prove that companies with high absorptive capacity have certain similarities in their practices and routines. Research on the microfoundations of absorptive capacity should be further explored by using case examples from various different industries and cultures. It would also be beneficial to study companies with lower than average absorptive capacity and compare their practices with the case examples presented in this study. Having established that Zahra and George's (2002) model of absorptive capacity successfully captures the complexity and dynamic nature of the absorptive capacity construct, it is reasonable to suggest that future studies should solely use the four-dimension model as their theoretical base. A standardized model would make comparisons between different studies less complicated and facilitate understanding of the practices associated with each dimension.

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