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What makes an innovative Dutch SME?

A KEYS to Organizational Creativity approach

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Abstract

This thesis empirically examines which KEYS to creativity (Amabile et al., 1996) in organizational culture and climate, leadership style, resources and skills and barriers to organizational creativity could be considered as the driving force behind the innovative capacity of SMEs in the Netherlands. By using a logit model to paint an initial portrait of 60 innovative Dutch SMEs as compared to 60 non or less innovative counterparts, this study hopes to aid to the complex puzzle why some firms are more innovative than others. This research tries to find answers to the aforementioned question by digging deeper into the complementary relationship between organizational creativity and innovation and proposes a conceptual framework by which the innovativeness of Dutch SMEs is determined by the higher levels of organizational creativity within the work environment. The logistic regression models indicate that the innovative Dutch SMEs are distinguishing themselves by their organizational encouragement to creativity, freedom and challenge in the arena of organizational culture and climate and supervisory encouragement as an important facet of their leadership style. Remarkably, the logit estimates further show that higher levels of resources lead to a lower probability of innovation to occur within Dutch SMEs. This result is also consolidated by the support for a optimal allocation of resources and skills in relationship to the innovativeness of Dutch SMEs. Combining these two results seems to indicate that the innovative SMEs in this study operate at the downward sloping side of the U-shaped curve where resources exhibit decreasing returns to the innovativeness of Dutch SMEs. Finally, an interesting and twofold finding of this thesis is the negative effect impeded by the confluence of organizational culture and climate and leadership style on innovativeness of Dutch SMEs.

JEL Classification: C1, J24; L2, M5; O31

Keywords: KEYS to creativity; Organizational culture and climate; Leadership style; Resources and skills; Product innovation; Logistic regression

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1. INTRODUCTION

Due to today's extremely competitive and dynamic market situations, the concept of creativity has been increasingly acknowledged as a significant organizational resource (Ford, 2000; Williamson, 2001). Organizations are forced, certainly more than ever before, to adapt and react to external threats and changes and human creativity is regarded as one of the most important antecedents of development (Weisberg, 1999; Csikszentmihalyi, 1999). Although there is still a lot of improvement possible concerning the specific dimensions that, on the one hand, encourage but also dampen the creative performance inside organizations, several researchers have created concepts such as *organizational creativity* to further understand creativity in an organizational context (Ford, 1996; Clitheroe et al., 1998). Organizational creativity is defined as "*the creation of a valuable, useful and new product, idea, procedure, service or process by individuals working together in complex social system* (Woodman et al., 1993, p. 293). The current importance of *organizational creativity* is carefully highlighted by Woodman et al. (1993) stating that it plays a vital role for organizational change and helps to understand the process of change, effectiveness and organizational survival. According to Amabile (1988) and Kanter (1998), the foundation for all *organizational creativity* lies in the creation of work environments that support and facilitate the creativity of all employees inside the organization. Andriopolous (2001), states in his literature review that *organizational creativity* is a function of five determinants: organizational climate, leadership style, organizational culture, resources and skills and the structure and systems of an organization.

Although research on creativity from an organizational context proliferated over the last decades (Woodman et al., 1993; Bharadwaj and Menon, 2000; Borghini, 2005), voluminous research on SMEs has remained to be focusing on innovative performance and their determinants (e.g., Van Praag & Versloot, 2007). Regarding the question why some firms are more innovative than others, remarkably, human and organizational creativity are not explicitly regarded as important determinants of innovative performance. However, when taking a closer look at the definitions of creativity and innovation (e.g., Sternberg and Lubart, 1999; Amabile, 1999), creativity can be regarded as the point of departure for innovation, the fuel for the innovation engine, the food that guarantees the growth of a baby both from an individual and organizational perspective. As defined by Bommer and Jallalas (2002, p, 2) "the foundation for innovation is ideas, and employees are the ones who ultimately create, develop and carry out ideas. Creative employees, who propose novel and useful ideas or

procedures, provide the firm with the resources for possible implementations necessary for innovation". In addition, innovations are manifested within organizational contexts. Tidd et al. (1997) accentuate that successful innovations are dependent on work environments in which novel and original ideas are able to flourish and deployed efficiently. And, despite of the fact that Amabile et al. (1996) note that creativity is a necessary but not sufficient condition for innovation, the above reasoning suggests that it is interesting to examine how innovative firms are able to distinguish themselves from their less innovative counterparts based on the determinants and barriers to organizational creativity and how innovative firms are characterized in terms of the determinants and barriers to organizational creativity compared to non-innovative firms.

Yet, since organizational creativity is a complex inquiry itself, a clear description of how firms can nurture and hamper levels of organizational creativity is required. Due to the different SME settings and continuously evolving external and internal environments, the creative performance of SMEs is influenced in many different ways and is consequently also stimulated and killed by numerous parameters. According to Williams and Yang (1999), the study of organizational creativity isn't only about analyzing the creativity of individuals or the creativity that stems from group work as they assert that the organizational creative process involves numerous links and relationships between variables and therefore different perspectives are ultimately required. In the last years, scholars have acknowledged the prominent influence of social and contextual factors (e.g., culture, resources, external environment, structure, ext.) on the creative performance of employees (Woodman et al., 1993; Shalley et al., 2004). To assess the influences of social and contextual factors on levels of organizational creativity and obtain a good perception of work environments that support and also hamper innovations, a creative work environment, there is a growing practice to use the KEYS to creativity framework of Amabile et al. (1996) as done by (Razulzada, 2007; Bommer and Jallalas, 2002). Based on extensive research, the KEYS to creativity framework addresses the total work environment perceptions of employees and consists out of six dimensions investigated to be supportive to creativity and two dimensions known to impede creativity of employees within the work environment.

In this thesis, I want to use the stimulant and obstacle scales from the KEYS to creativity framework of Amabile et al. (1996) to see if innovative Dutch SMEs distinguish themselves from their less innovative counterparts by their creative performance and paint an

initial portrait of the innovative Dutch SME in terms of their organizational culture and climate, leadership style, resources and skills – as addressed by the literature review of Andriopolous (2000) as determinants of organizational creativity – and barriers to organizational creativity (e.g., Kimberly and Evanisko, 1981; Kimberly, 1981) answering the following central research question:

Research Question: *"Which keys to creativity in organizational culture and climate, leadership style, resources and skills and organizational barriers to creativity determine the innovativeness of SMEs in the Netherlands"?*

When rephrasing the research question, this study actually tries to answer two questions: why are some SMEs innovative and some not? And if they are, is this due to the organizational determinants of organizational creativity? By addressing these questions, this study can therefore contribute to voluminous research that still takes place to examine why some firms are more innovative than others. In this interesting debate, researchers have been focusing on indicators such as firm size and age, R&D efforts, patents and patent applications, new product announcements, ext. (Kleinknecht et al., 2002*).* And, since creativity and innovation are most of the time used interchangeably in the literature due to several overlaps and similarities (Simolenski and Kleiner, 1995), organizational creativity has not been regarded explicitly as an important antecedent for innovative activity within organizations and more specifically SMEs before. In addition, this study goes in depth into organizational contextual and social factors since the literature has identified these as having the most effect on innovation (Damanpour, 1991). And, most importantly, little empirical research has been conducted on employees' perceptions concerning the influences of organizational factors on innovation (Oldham and Cummings, 1996; Axtell et al., 2000).

The data for this research will be collected together with a fellow master student, S. Maarseveen, from the Erasmus University of Rotterdam as he will use this dataset to examine the main determinants of innovation for these Dutch SMEs in the Netherlands[3] and this thesis is an extension of the Scientific Research Project 2011 conducted for study association

[3] Fellow student is S. Maarseveen and he will focus on the determinants of innovation: Organizational creativity, knowledge appropriation and entrepreneurial capital. For more information look for S. Maarseveen: "*What makes innovation happen" (2010)*

EUREOS. Although the same dataset will be used for the two theses, this thesis differentiates from the thesis of S. Maarseveen by an extensive and in-depth investigation on the concept of organizational creativity and its relationship with innovation whereas S. Maarseveen follows a more broader approach and focuses on the interactions of organizational creativity, knowledge appropriation and entrepreneurial capital and their relationship with innovation. The data will consist of 120 SMEs distributed over two groups of SMEs and will be briefly presented in the following section. The first will be selected from the Syntens MKB innovation top 100 award[4] and the second will be drawn randomly from the Dutch population based on the conditions of the innovative group. In this thesis, a Dutch SME is regarded as innovative when involved in a product innovation in the last two years. The choice for product innovations will be explained in the next section. The innovative group will further be evaluated by guidelines of GEM (General Entrepreneurial Monitor) and the Dutch MKB top 100 and the requirements will be explicitly defined in chapter four. The data for this study can be regarded as original since innovative activities within SMEs are most of the time analyzed within technology abundant industries and this research is focusing on a wide variety of industries ranging from the food and non-food branch to consultancy industries. Plus, to my best knowledge, no research on the total work environment perceptions of personnel regarding organizational creativity within SMEs has been conducted before in the Netherlands.

In the main body a theoretical framework will be build around the determinants of organizational creativity from the perspective of three main conceptualized areas: climate and culture, leadership style and resources and skills (based on the literature review of Andriopoulos, 2001). The theoretical framework will emphasize how the three arena's will be assessed (measured) by the conceptual model of KEYS to creativity of Amabile et al. (1996) out of which the consecutive hypotheses for the organizational determinants and their expected relationship with innovation will be postulated. In addition, the barriers to creativity as given in the literature will be mentioned and the theoretical framework will again elaborate on how they will be assessed by the conceptual model of Amabile et al. (1996) and this information will be used to construct the hypotheses on organizational barriers to creativity

[4]http://www.syntens.nl/innovatietop100/top-100-2010/top-100-2010.aspx

and the relationship with innovation. At last, the organizational creativity framework for product innovations will summarize the theoretical framework.

The relevance's of such a study have been elaborated above; organizational creativity might play a vital role in organizational change and helps to understand fundamental functions within SMEs such as effectiveness, development and organizational survival (Woodman et al., 1993). In addition, innovativeness within SMEs is known to foster productivity, efficiency and growth (Van Praag & Versloot, 2007). Investigating on the relationship between these two immersive phenomenon's in today's business environment is relevant for business managers as well as for researchers. Also, emphasizing on the specific organizational determinants within Dutch SMEs that lead to supportive environments in which innovation are able to flourish can be a contribution to Dutch SMEs in general. Contextual factors of culture and climate, leadership style and resources and skills play an immense role in every day processes of SMEs and finding the right balance in these subsystems could yield in effectiveness and efficiency as well as an optimal work environment for employees. Moreover, the KEYS to creativity framework zoom in on the impediments to creativity within work environments of SMEs and leaves possibilities to detect areas of improvements. Also, the organizational determinants of the innovative group of SMEs can be compared to the less or non innovative control group. The latter might use the results of this study to mirror their current operations and imitate their more innovative counterparts and hopefully be encouraged to experiment more with creativity and acknowledge the significance of creativity for their SME. At last, patterns within the organizational arena of less or non-innovative Dutch SMEs can be observed to emphasize why their innovative activities are lacking.

2. DEFINITIONS AND MEASUREMENT

In this section, the literature will be reviewed concerning the definitions of both innovation and creativity as well as the concepts of human and organizational creativity. To depict the innovative SME in this study, this section will shortly introduce the method and starting point that will be used in this thesis to measure innovation. In addition, this section will elucidate on the KEYS framework that will be used in this thesis to obtain both the determinants and barriers to organizational creativity within the work environments of Dutch SMEs.

2.1. Defining Innovation

When talking about innovative SMEs it is important to give a definition of innovation which is easier said than done as the term is notoriously ambiguous and has no overall or clear definition (Cooper, 1998; Adams et al., 2006). Considering the literature on the concept of innovation several "more general" definitions are represented in table 1. It can be noticed that since the introduction of the concept of innovation by Schumpeter the definitions have stayed quite consistent. Almost every definition starts with a "new idea" which is close to an invention, still the terms transformation and implementation/commercialisation are mentioned in the same phrase denoting that an invention does not equal an innovation yet only in its narrowest sense (Drucker, 1994; Gurteen, 1998; Baregheh et al., 2009). In addition, it is notable that the concept of innovation is transforming from a phenomenon external to the firm to a purposive act of the firm that is: making innovation happen (Gurteen, 1998; Love and Roper, 1999; Baregheh et al., 2009). Baregheh et al. (2009) attempted to come to a multidisciplinary definition of innovation by generating a representative pool of definitions from different disciplines in literature and proposed both a diagrammatic and a textual definition of innovation as can be seen in table 1. The definition of Baregheh et al. (2009) together with the definition of the Oslo Manual (2005) is probably the closest we get when trying to capture innovation within a single expression. Yet there is more to the term innovation as there are different types of innovation to distinguish making the concept of innovation even more complex.

TABLE 1

Definitions of Innovation

1939, 1947	Schumpeter	*"..carrying out of new combinations."*
1973	Zaltman et al. p. 10	*"..any idea, practice or material artefact perceived to be new by the relevant unit of adoption."*
1998	Gurteen p. 6	*"..the sifting, refining and most critically the implementation of ideas. It's about putting generated ideas into action."*
1999	Love and Roper p. 48	*"..a commercial rather than a technological activity, which is related to and affects firms' competitive position."*
2005	Oslo Manual 3rd edition, p. 46	*"..the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations."*
2009	Baregheh et al. p. 1334	*"..the multi-stage process whereby organizations transform ideas into new/improved products, services or processes, in order to advance, compete and differentiate themselves successfully in their marketplace."*

2.2. Defining Creativity and Organizational creativity

Before investigating if innovative Dutch SMEs have found the KEYS to creativity in their work environment as compared to their less innovative counterparts it is adequate to give a definition of creativity and organizational creativity. Due to its multidimensional nature and applicability in, among others, the fields of arts, economics, sociology and business, there are more than thousand definitions of creativity (Cougar, 1995). The most common used definition of creativity in the literature is: "A response will be judged as creative to the extent that (a) it is both a novel and appropriate, useful, or valuable response to the task at hand and

(b) the task is heuristic rather than algorithmic" (Amabile, 1996, p. 35). In this, heuristic refers to a departure from the status quo, where algorithmic means finding an answer to an already tried solution. In short, it is the production of a useful response, product or process to an open ended task. In this definition, Amabile (1996) associates creativity with some sort of response and she tries to incorporate the complexity or ambiguity of the concept of creativity. In the same line of argument, Sternberg and Lubart (1999) seem to agree on the novel and appropriateness hidden inside creativity, defining creativity as: "the ability to produce work that is both novel and appropriate" (Sternberg and Lubart 1999 p. 3). Sternberg and Lubart (1999) try to narrow the concept of creativity by using work in their definition. On the other hand, Solomon, Powell and Gardner (1999) associate creativity with a product, something tangible, describing creativity as a creation embedded with new and useful aspects. One definition on creativity that appeals to me is a definition of James Adams in his book "Conceptual Blockbusting". In this book, he defines creativity as: "the combination of seemingly disparate parts into a functioning and useful whole" (Adams, 1990 p. 16). With this definition, James Adams accomplishes to demonstrate that a creative individuals deals with the production of 'something' out of 'nothing'. Furthermore, James Adams achieves to formulate the dictionary's definition of creativity into a more expressing and poetic one. Probably, one of the most encapsulating definitions on creativity that also emphasizes the importance of creativity from an organizational context comes from Herrmann (1996). In an attempt to give a short definition on creativity he says: "What is creativity? Among other things, it is the ability to challenge assumptions, recognize patterns, see in new ways, make new connections, take risks and seize upon change" (Herrmann, 1996 p. 245). In my opinion, this definition achieves to capture the whole identity and personality of the creative individual and in some way summarizes all the definitions mentioned in the literature.

Since research on creativity from an organizational context has only proliferated in the last couple of years, creativity in this arena is only defined by a few authors. In addition, creativity and innovation from an organizational context are most of the used synonymously (Smolensky and Kleiner, 1995). In an attempt to differentiate the two concepts, creativity was defined as the production of new perspectives, ideas and products as to be applied for organizations (Ford, 1996; Oldham & Cummings, 1996; West and Farr, 1990). To address creativity from an organizational context, Woodman et al. (1993) proposed the term "organizational creativity" and defined it as: "the creation of a valuable, useful and new

product, service, idea, procedure or process by individuals working together in a complex social setting" (p, 293). On a continuing note, Bharadwaj and Menon (2000) referred organizational creativity as the extent to which creativity is structurally embedded in the system. In this structurally embedded means the extent to which the organization is dedicated to creativity, establishes formal structures and systems and is willing to allocate resources to support creative problem solvers.

2.3. Measuring Innovation: Physical end product/service

In the scope of this research, innovation by a firm is confined to physical product (service) innovations. One reason for this choice of measurement is that product (service) innovations are tangible and less ambiguous than e.g. social innovations, which contribute to the validity of this measurement. As the Oslo Manual (2005) states, the broad use of the definition innovation and addition of different types implies that an increasing percentage of firms meet the basic requirements to be innovative. It is not sufficient to know whether a firm is innovative or not yet distinguishing between the types of innovation can contribute to a better understanding of the innovative capabilities and activities.

The measurement method identifying an innovative firm in this paper will be clarified in detail under the empirical part. However, it should be clear that the ground to measure actually commercialized product (service) innovations is due to the severe drawbacks in most other commonly used measurements of innovation (Kleinknecht et al., 2002; Acs and Audretsch, 2005; Hall, Jaffe and Trajtenberg, 2005). One of these commonly used measurements of innovation are Research and Development expenditures yet this is an input to the process of innovation and an input is as good as its efficient use by the processors towards the output. In addition, SMEs often tend to innovate without formal R&D expenditures resulting in R&D being an input in some yet not all cases (Kleinknecht et al., 2002; Acs and Audretsch, 2005). Other commonly measurements are patent and patent citations with the drawbacks being patents which are not commercialized, also known as sleeping patents, and the fact that especially SMEs do not tend to patent innovations at all (Kleinknecht et al., 2002; Hall, Jaffe and Trajtenberg, 2005). For a detailed analysis of the measurement methods the cited papers are referred to. Giving an in depth description of the different innovation measurement methods would be outside the scope of this research as we investigate the determinants of innovative SMEs. Thus, a classification of innovative SMEs

by direct measures of their innovative output suffices and is besides preferred in many cases (Kleinknecht et al., 2002; Acs and Audretsch, 2005). Having demarcated an innovative SME the following parts will deal with the expected components making up this innovative SME.

2.4. Measuring creativity in work environments: KEYS framework

As mentioned in the introductory chapter, there is a growing tendency to determine the level of organizational creativity by the perceived creative work environment of organizations (e.g., Bommer and Jalallas, 2002; Razulzada, 2007). "*According to contextual theories of organizational creativity, it is the psychological meaning of environmental events that largely influences creative behaviour"* (Amabile et al., 1996, p. 1158). In this thesis, organizational creativity is measured by the KEYS to creativity framework that was developed by the Center for Creative Leadership together with Harvard Business School professor Theresa Amabile (1995). The framework is based on an in depth analysis of 12000 managers and employees from organizations all over the world over a 12-year period and distinguishes itself from other frameworks due to the focus on people to people interactions instead of processes and systems[5]. Based on the assumption that individuals are more able to reveal their perceptions when asked for self-report responses on conditions in the work environment, the KEYS framework manages to identify individual's perceptions as well as the relation of these perceptions to the level of creativity. As outlined by earlier work of Pierce and colleagues (1989), the KEYS framework therefore copes with the "total-work-environment level of analysis". The KEYS framework is established to assess the environment for creativity and innovation for every given organization and focuses on practices of supervisors and managers that have a significant influence on and encourage creativity and innovation. It aims at identifying the particular areas in the organization that turn out to nurture or dampen individuals from working at their highest creative potential and therefore perfectly coincides with the objectives of this thesis. The KEYS framework originates from and is a more detailed elaboration of the earlier explained componential theory of individual creativity (Amabile, 1983) and the componential theory of organizational creativity and innovation (Amabile, 1988). The latter is shortly discussed below to lay the foundation for the KEYS

[5] Practical information on validity and reliability of the KEYS framework will follow in the empirical part. This will more precisely motivate my choice for this tool.

framework and introduce the stimulant and obstacle scales that will be used for the subsequent hypotheses of this thesis.

The componential theory of organizational creativity and innovation (Amabile, 1988) contains an interrelated circle in which individual creativity integrates with the work environment and is affected by its specific conditions and activities. In this, the work environment is shaped by three interrelated components – *organizational motivation to innovate, resources and managerial practices* - that serve as necessary conditions for innovation to occur within organizations. To obtain the highest level of organizational innovation, the model states that the three components need to be in perfect balance. In addition, the three components are positively stimulated by the levels of individual and team creativity that stem from the creativity-thinking skills, domain relevant skills and intrinsic motivation of individuals (Amabile, 1983). As in the componential theory of individual creativity, the crucial contribution of this theory is that the intrinsic motivation of employees plays a more than determining role for the existence of organizational innovation as it is affected most significantly by factors in the work environment.

The three organizational components necessary for innovation in this theory are best explained by the following: *(1) Organizational motivation to innovate* elucidates the basic attitude of the organization towards innovation, as well as the encouragement of creativity and innovation throughout the organization. *(2) Resources* comprehend everything the organization wishes to spend on the improvement of innovation-related activities in a particular subsystem. *(3) Management practices* refer to all the actions the organization undertakes to guarantee a balanced work environment in which individuals are able to flourish. It is concerned with management at all the divisions of the organization with a major focus on individual departments and projects. Management practices, for example, deal with the composition of efficient work groups in which individuals from different backgrounds embedding diverse skills and experiences are drawn together and are probably the most influencing component of the componential model (Amabile, 1988).

In order to construct the KEYS framework and its work environment scales, the three above described components of the work environment in the componential theory of creativity and innovation (Amabile, 1983) were coherently categorized and investigated from two primary sources. The first consisted of previous research on related instruments and theories. The second source was a 3-phased study on projects that required both high and low

levels of creativity at High Tech Electronics International, a company that entails around 30.000 employees and numerous divisions and departments. In contrast to the componential theory of creativity and innovation (Amabile, 1983), the Model underlying KEYS consists of the following five major conceptual categories: *Encouragement of Creativity, Autonomy or Freedom, Resources, Pressures and Organizational Impediments to Creativity.* Each of these categories is hypothesized to influence creativity and innovation. The study at High Tech Electronics International resulted in the KEYS environment scales that were grown out of the five major categories. Conditional results of this study that correlated positively with the creative output of organizations are referred to as 'stimulant scales' and negatively as 'obstacle scales'. Consequently, the following stimulant and obstacle scales for the five components can be highlighted: *Encouragement of Creativity* stems positively from the conditions of Organizational Encouragement, Supervisory encouragement and Work group supports. The component of *Autonomy or Freedom* originates out of the enhancing Freedom scale. *Resources* are a function of the stimulant conditions of the sufficient resources scale. The *Pressure* category is manifested from the positive outcomes of challenging work and dampened by the conditions of workload pressure. The last component, *organizational impediments of creativity,* is logically influenced by the organizational barriers to creativity.

As elucidated above, the KEYS framework and the stimulant and obstacle scales originate from an extensive body of research on the determinants and barriers to organizational creativity. The determinants and barriers to organizational creativity will be introduced in the next section.

3. THEORY AND HYPOTHESES

In this section, an organizational creativity framework for innovation is introduced in which the stimulant and obstacle scales of the aforementioned KEYS framework will be linked to the determinants and barriers to organizational creativity in the literature and the relationship between the innovativeness of Dutch SMEs is hypothesized.

3.1. Determinants of Organizational Creativity in SMEs

Creativity within business organizations is a complex and dynamic phenomenon. Due to the different organizational settings and continuously evolving external and internal environments, the creative performance of organizations is influenced in many different ways and is consequently also stimulated and killed by numerous parameters. According to Williams and Yang (1999), the study of organizational creativity isn't only about analyzing the creativity of individuals or the creativity that stems from group work as they assert that the organizational creative process involves numerous links and relationships between variables and therefore different perspectives are ultimately required. Where individual creativity is certainly of a great importance to organizational creativity, the emphasis of organizations on work and outcomes makes creativity in organizations by definition dependent on a collective effort (Scott, 1992; Aldrich, 1999). In this, creative individuals will never be able to complete on their own and therefore need to be guided, supported and stimulated through efficient practices and routines of organizations. By building further upon the traditional approaches to creativity in which creative individuals were distinguished by their personality characteristics and mental attributes (Barron and Herrington, 1981; Davis, 1988), several organizational researchers started to focus more on the existence and survival of creative individuals in organizational contexts. As proposed firstly by Woodman et al. (1993), more and more theoretical models were introduced that incorporated on the effects of contextual factors at work and the influences of the social environment on the creative behaviour of individuals (Turnipseed, 1994; Ford, 1996; Amabile et al., 1996; Oldham & Cummings, 1996; Shalley et al. 2004).

In this new perspective, Woodman et al. (1993) made a vital contribution when they introduced the multi-level perspective of organizational creativity in which organizational

creativity originates out of creative individuals and groups that are subjected to social and contextual influences at work. In this path-breaking framework, individual creativity is a function of individual characteristics (knowledge, personality and motivation) and situational and contextual characteristics (e.g., physical environment), group creativity stems from individual creativity, the combination and interaction of group members (e.g., group composition), the size, norms and cohesiveness of the group (e.g., group characteristics) and contextual influences and organizational creativity originates out of group creativity and dimensions or subsystems in the work environment such as culture, climate and reward systems. Closely related to this and probably one of the most well-known models in this field is the conceptual model of Amabile et al. (1996) elucidated in the previous section. Oldham and Cummings (1996) examined the effects of creativity relevant personal (e.g., broad interest, attraction to complexity, intuition, high energy, etc.) and contextual characteristics – job complexity and supervisory support – on the creativity of employees. Ford (1996) tried to extent the writings of Amabile (1988) and Woodman et al. (1993) by introducing the influences of multiple social domains – markets, institutional environments, organizations and subunits - on the creative actions of individuals.

As elucidated above, an extensive body of research is thus available that focuses on the conditions within the work environment that facilitate employee creativity. Still, there is a lack of one single and agreed upon theory of organizational creativity and the specific antecedents of creativity inside organizations have not been determined explicitly (Oldham & Cummings, 1996). To provide an initial clarification on the complex inquiry of organizational creativity, Andriopolous (2001) synthesized most relevant writings and theoretical models to address the following two questions: "*how can organizations nurture creativity within their work environment?"* and "*what are the main determinants of organizational creativity?"* The literature review consequently produced five factors that were most frequently acknowledged as stimulants of creativity within different work environments.

- Organizational climate
- Organizational culture
- Leadership and Style
- Resources and Skills
- Structure and systems

Scholars emphasize that the five above mentioned subsystems embedded in organizations instigate conditions that are able to facilitate both the levels of team and individual creativity (Glynn, 1996; Drazin et al., 1999). Addressing these specific features of the work environment can distinguish the organizational context from others in terms of their creative performance. In the consecutive sections of this chapter, the first four catalyzing factors of organizational creativity – organizational climate, culture, leadership style and resources and skills - will be elucidated by mentioning how they can be implemented optimally by SMEs. For the purpose of this thesis, the determinant of structure and systems will not be included in the theoretical framework and emphasized in detail, since questions on finding the most efficient structure and systems for organizational creativity appear, to my best knowledge, as a concern for larger enterprises and our dataset depicts mostly micro firms with fewer than 10 employees and small firms with fewer than 50 employees in which no complex structures and systems are expected. In addition, the dimensions within the determinants of organizational culture and climate as conducive to organizational creativity are most of the times overlapping and used interchangeably in the literature and therefore they will be combined in the theoretical framework and merged in the empirical part into one broad and influential determinants inside organizations. Moreover, the KEYS framework is a detailed articulation of voluminous earlier research in which both culture and climate have been regarded to describe the organizational work environment for creativity. The next section will begin with an introduction on the concepts of organizational culture and climate.

3.1.1. Organizational culture and climate

In the organizational culture literature, the terms organizational climate and organizational culture and their consecutive antecedents are sometimes used interchangeably. The concept of organizational culture is extremely broad, difficult to define succinctly and numerous researchers have tried to define its true meaning. There seems to be a consensus among scholars that organizational culture epitomizes "*the deepest level of basic values, assumptions and beliefs that are shared by the organization's members and are manifested by actions especially from managers and leaders*" (Locke and Kirckpatrick, 1995; Morgan, 1991; Johnson and Scholes, 1984; Cook, 1998) as cited in Andriopolous (2001, p. 835). In other words, the organizational or corporate culture shapes a framework that determines how

members within the social setting think, feel and act. In addition, the organizational culture manifests the shared set of practices, directions, routines, priorities and commitments that are espoused by an organization and influences the degree of loyalty, strengths and embeddedness of relationships and personal worth of members. According to Deal and Kennedy (1982), organizational or corporate culture cultivates the core identity of organizations and plays a vital role in the behaviour of employees. They further assert that organizational culture depicts a set of values and assumptions that accentuate the statement: *"this is how we do things around here"*. Closely related, Jones (1983) elucidates the significance of organizational culture by stating that it serves as a cognitive map that assembles how the context is defined and selects the set of norms and values that member's event. Overall, there seems to be a consensus that the established cultural elements to a large extent determine the degree of creativity that is displayed within an organization (Tesluk et al., 1997; Judge et al., 1997; Turnipseed, 1994; Shaugnessy, 1988; Tushman and O'reilly, 1997).

Although several similarities can indeed be postured and authors seem to intertwine the content of organizational culture and climate, some scholars have correctly highlighted several differences between these concepts (Amabile et al., 1996; Martin, 2002). Where the culture of the organization is known to be slowly changing and deeply rooted inside the values and beliefs of employees (Martin, 2002), organizational climate, on the other hand, is more behaviourally oriented as it refers to the behavioural patterns of individuals inside the work environment as manifested by their assumptions, meanings and beliefs that originate out of the organizational culture (Mclean, 2005). On the same line of argument, Schein (1985) and Schneider (1990) differentiate these concepts by referring organizational climate as a surface manifestation of organizational culture. Schneider (2000) continues to emphasize that the organizational climate determines the things that individuals are subjected to within the organization. More precise, organizational climate is defined as *"the recurring patterns of behaviour, attitudes and feelings that characterize life in an organization"* (Isaksen et al. 2001, p.171). Morgan (1991) associates the climate of the organization with its 'atmosphere' or 'mood'. The above discussion highlights that the patterns of behaviour, attitudes and feelings within the 'working atmosphere' certainly play a major role in the aspiration and passion of individuals to work, their perception of work as well as their levels of performance, the input of creative ideas and the resulting creative output that is produced at work and

organizations should do their utmost to establish a facilitating organizational climate (Cummings, 1965; Van Gundy, 1987; Tesluk et al., 1997).

At this point, scholars have thus pointed out the prominent role of a facilitating organizational culture and climate in the process of organizational creativity. However, several authors have also pointed out the existence of a paradox regarding organizational culture and climate: since the shared assumptions, routines and indirectly the corresponding mood and atmospheres in the work environment, as determined by the organizational culture and climate, led to success in the past, they are no longer questioned and taken for granted. Over time, these unquestioned priorities and accepted work environments may lead to routinized behaviour and this might dampen creativity and lead to a possible hindrance of learning and development (Glor, 1997; Tushman and O'reilly, 1997; Barret, 1998). Pheysey (1993) interestingly notes that the patterns of belief, ritual and practice are deeply rooted, long standing and evolve over a significant amount of time. Established organizational cultures and climates might over time thus lead to standardized processes and predictable behaviour of employees conflicting with a 'culture of change'. According to Kanter (1989), culture has traditional and stable qualities and resolves the dilemma of bureaucracy; the common procedures and practices yield business integrity yet impede processes of autonomy and innovation. By this reasoning, an optimal point could be expected regarding a facilitating organizational culture and climate and the tendency of Dutch SMEs to depart from the status quo and the introduction of a product innovation. From this, the following hypothesis is formulated:

H1: *There is a relationship of decreasing returns between an embedded organizational culture and climate and the innovativeness of Dutch SMEs.*

As stated by Andriopolous (2001), organizations face a significant challenge to establish an organizational culture and climate that flourishes creativity and innovation and stimulates innovative ways of assessing problems and finding solutions. In the quest for a nurturing organizational culture and climate, Martins and Terblanche (2003) made a vital contribution. In their model, organizational culture and climate is regarded as one of the most significant drivers of an organization's success and survival. Successful organizations have the capacity to establish an organizational culture and consecutive management processes that

absorb creativity in all possible ways. Martins and Terblanche (2003) posit a framework in which the common values, beliefs and behaviour as manifested by the organizational culture are believed to impact creativity in two ways. First, organizational members acquire accepted behaviour and learn the efficient functioning of activities through a socialization process in which the assumptions that arise out of the shared and accepted norms and beliefs determine whether creative activities are concerned as daily operations of the organization (Chatman, 1991; Louis, 1980) as cited in Tesluk et al. (1997). Second, the structure, processes, practices and management practices that originate out of the basic set of values, beliefs and assumptions have a vital and direct impact on creativity within the social work environment. For example, management practices determine if sufficient resources are available to pursue the development of novel and applicable ideas within the organization (Tesluk et al., 1997).

In their integrated interactive framework, organizational culture and climate originates out of the dimensions of mission and vision, external environment, means to achieve objectives, image of the organization, management processes, employee needs and objectives, interpersonal relationships and leadership. Out of these dimensions of organizational culture, five determinants evolved to be conducive to creativity inside organizations. These are:

- Strategy
- Structure
- Support mechanisms
- Behaviour that encourages innovation
- Communication

To encourage creativity within organizations, Martins and Terblanche (2003) propose that the strategy needs to coincide with the mission and vision espoused by the organization and send out a significant degree of purposefulness (Covey, 1993; Judge et al., 1997), the organization needs to be structured so that flexibility and freedom (e.g., autonomy, empowerment and decision making) is guaranteed (Judge et al., 1997, Arad et al., 1997), organizational processes and mechanisms need to be supported by a stimulating reward and recognition system and members within the social setting need to have access to an adequate set of resources (e.g., time and information technology) (Shattow, 1996; Bresnahan, 1997), the work environment is characterized by mistake and conflict handling, idea generation, a

continuous learning culture that involves risk taking and competitiveness that supports change and finally an open flow of communication (Lock and Kirckpatrick, 1995; Samaha, 1996).

When evaluating the determinants mentioned by Martins and Terblanche (2003), many researchers have depicted the importance of an open flow of communication to encourage creativity in the social work environment (Angle, 1989; Kanter, 1983; Amabile, 1998; Robinson and Stern, 1997). The shared values and beliefs that elevate an open information channel should have an enhancing effect on the creative performance of individuals (Amabile, 1998). On the same line of argument, several authors have regarded an open-door communication policy, in which individuals, teams and other domains within the organization are encouraged and able to openly communicate at all times, as a necessary factor within the organizational culture as supportive to creativity (Filipczak, 1997; Frohman and Pascarella, 1990; Samaha, 1996). According to Kanter (1983), effective creativity flourishes in situations of horizontal information channels and intersecting domains most often supported within a matrix organization that emphasizes integrative structures and exists out of multiple structural linkages. These linkages, for example, determine to what extent communication channels serve as a potential source of innovation and creativity within an organization since it connects different business units and enables employees to share their expertise, knowledge and ideas throughout the whole organization. In a more practical example, Robinson and Stern (1997) examined a particular invention at 3M company and highlighted how an open exchange of information led to a commercial success in the form of an innovation. A strong organizational culture that encouraged and tolerated novel and applicable ideas, motivated scientists of 3M to connect and exchange their ideas with scientists in other units of the organization and this led to severe synergy effects and accelerated the research process since new ideas were now applied throughout every department of the organization.

Risk taking is also regarded in the literature as an important dimension of organizational culture and climate at the heart of creative behaviour inside organizations (Amabile, 1988; Sternberg et al., 1997). Interestingly, Ahmed (1998) has stated that a significant amount of organizations in his environment actually tried to avoid activities that were associated with innovations since they were thought to be subjected to large amounts of risks and uncertainty. This statement directly coincides with and can be explained by a well-known theory proposed by Kahneman and Tversky (1982) which addressed that individuals

have a propensity towards risks only in situations when losses were at stake and turned out to be risk-averse when choosing between potential gains. The same theory actually holds for the organization. According to Amabile (1998), organizations mostly associate risk taking with a significant amount of change and adjustments and they are reluctant to depart from the status quo since the existing path has led to success in the past. Despite of this phenomenon, the vast majority of organizations actually claim to acknowledge the significance of creativity and strive for a circulation of new and applicable ideas. The above discussion displays that organizations face a challenge to acknowledge the significance of risk taking and implement it in their culture. As elucidated above, organizational cultures are mostly deeply rooted, long standing and evolving over time (Martin, 2002). Members of organizations behave according to the set of values, norms and beliefs that are told and retold over and over again and organizations need to guarantee that the repeated myths and stories pay attention to the importance of risk taking. In this way, members will be encouraged to think about uncertainty, feel the freedom of taking risks, start acting accordingly and believe that there is a fair chance of risks being successful. Zajonc (1968) refers to this as the "mere-exposure effect": individuals start to appreciate certain situations or concepts when they are getting familiar with the exposure and hear and study more about it.

In his search for the norms that facilitate creativity within organizations, Ahmed (1998) accentuates the close connection between freedom and risk taking. Individuals will start to implement risk taking into their daily behaviour when they are given the freedom to reach the mountain top in their own way and operate autonomously. In this, he highlights the importance of experimentation, the departure of the status quo, acceptance of failure, freedom to discuss inappropriate and uncreative ideas and no punishment for failure. The latter is referred to by Anderson et al. (1992) as an organizational culture in which participative safety is stimulated and ensured. Anderson et al. (1992) suggest that in order for employees to address problems and solutions in creative ways, organizations need to guarantee an environment free of criticism and punishment. On the same line of argument, Mumford et al. (1997) named tolerance of conflict as a value that could foster creative behaviour. According to Brand (1998), the creative potential of individuals is therefore more able to flourish in social environments of organizations that emphasize a long term vision and strategy in which it is more allowed to make small mistakes and tolerate conflict in the short run.

The above explained dimensions of organizational culture and climate - collaborative and open idea flow and risk taking- are, among others, conceptualized in this thesis as the stimulant scale of organizational encouragement of creativity in the model of Amabile et al. (1996). In addition, the dimension of organizational encouragement evaluates the perceptions of employees on the aspects of idea generation, fair and supportive evaluation of new ideas, reward and recognition of creativity and participative management and decision making as elaborated by numerous authors as supportive to creativity (Kanter, 1983; Cummings, 1965; Kimberly and Evanisko, 1981; Abbey and Dickson, 1983; Hennessy, Amabile & Martinage, 1989). All these aspects of organizational encouragement to creativity can be regarded as if they stem either from the accepted set of values, beliefs and norms or from certain accepted patterns of behaviour and assumptions and therefore they are measured as part of the organizational climate or culture in this thesis.

In line with the organizational creativity framework for product innovations proposed in this thesis, Dutch SMEs that are able to prioritize and stimulate creativity in all possible domains, openly exchange information on the significance of creativity and display and back up this significance in the strategy, rewards and measurements are also hypothesized to nurture their product innovations. From this reasoning, the following hypothesis is formulated:

H2: *Dutch SMEs possessing higher levels of organizational encouragement in their organizational culture and climate are more likely to be involved in a product innovation.*

Regarding a facilitating organizational culture and climate, the work of Goran Ekvall need to be considered. Based on an extensive body of research (e.g. Ekvall, 1987; 1991; 1996), Ekvall et al. (2000) extended the Creative Climate Questionnaire (CCQ) and validated the Situational Outlook Questionnaire (SOQ) in which 9 conditions of the organizational climate are emphasized that either facilitate or hamper creativity inside organizations:

- Challenge and involvement: Explains to which degree individuals are involved in challenging and contributing activities, goals and vision of the organization.
- Freedom: The autonomy that individuals can exert within their daily activities
- Idea-support: Displays to which degree new ideas are encouraged and supported

- Trust/openness: Shows the levels of reciprocity and safety in relationships among individuals.
- Playfulness/humor: Depicts the levels of spontaneity and ease exposed in the work environment.
- Debates: Represents the collapse of different backgrounds and experiences and the consecutive ideas that are communicated through this collapse.
- Conflicts: Displays the destructive competition and disagreements between individuals with different experiences and backgrounds.
- Risk-taking: The degree to which individuals are inspired to depart from the status quo.
- Idea time: If ideas can be worked out within given time barriers and the amount of time that is actually used to work out the ideas.

Out of these dimensions, only work environments that inhibit high levels of organizational conflict are less likely to sustain creativity (Ekvall et al., 2000). The Situational Outlook Questionnaire is very closely related to the Keys framework elucidated previously (Amabile, 1995; Amabile et al., 1996). In the conceptual model of Amabile et al. (1996) two climate dimensions of the Situational Outlook Questionnaire are explicitly regarded as prominent factors within the ideological work environment for creativity within business organizations: Freedom or Autonomy and Challenge (Amabile et al., 1996).

Freedom or autonomy is about the degree to which members are given latitude to deal with the tasks that are given (Amabile, 1998; Ekvall et al., 2000). There seems to be a consensus among researchers that individuals and teams come closest to their creative potential when they are given ownership and control over their own ideas and work (Bailyn, 1985; King & West, 1985; Ahmed, 1998; Robinson & Stern, 1997). In an empirical study on children's activities and behaviour, Amabile and Gitomer (1984) showed that more creative work was produced by children that were totally free in how to succeed in their assigned task. As with single individuals, employees will also be more creative when they experience autonomy in the process of problem solving and addressing solutions. Employees need to be granted latitude in the selection of their means, tools and structures – the process of problem solving - but typical not the expected outcome. Or, as stated by Amabile (1998): "people will be more creative if you give them freedom to decide how to climb a particular mountain"

(Amabile, 1998 p. 81). The literature study by Arad et al. (1997) showed that the authority and freedom given to individuals correlated with empowerment and this on its turn was positively associated with individual creativity. Autonomy or freedom heightens creativity because it enhances intrinsic motivation and gives employees the chance to align problems and solutions to their expertise and creative thinking skills (Amabile, 1998). On the same line of argument, Robinson and Stern (1997) propose that intrinsic motivation is enhanced in situations where individuals and teams are encouraged to self-initiated activity and find ways to really connect to their problems and solutions. On a continuing note, Ahmed (1998) emphasize that individual creativity is promoted when norms of the organization stimulate the freedom to experiment and the freedom to take different routes to solutions. However, this does not imply that individuals should be free to decide on which projects they preferably work. Amabile (1998) accentuates that the strategic goals of organizations still need to be clearly specified in order to enhance individual creativity.

In this thesis, the above sketched situations in the work environment are assessed by the stimulant scale of freedom or autonomy from the KEYS framework (Amabile et al., 1996). The dimension of freedom evaluates the perception of employees on project autonomy, the freedom to switch between projects and the amount of control that is exerted over the work of personnel (Amabile et al. 1996).

In line with the organizational creativity framework for product innovations proposed in this thesis, Dutch SMEs that are able to exert high degrees of autonomy in their daily work environment in which employees are, to a certain extent, free in their choices, decision making and the process of problem solving and espoused to align problems and solutions to their expertise and creative thinking skills are hypothesized to facilitate the process of product innovations. By this reasoning, the following hypothesis is postulated:

H3: *Dutch SMEs possessing higher levels of freedom in their organizational culture and climate are more likely to be involved in a product innovation.*

Closely related to freedom or autonomy, work environments of organizations also need to guarantee a challenging atmosphere. As mentioned above, challenge displays to what degree employees are involved in challenging and contributing activities and to what extent these activities are in line with the strategy, mission and vision of the organization (Amabile,

1988; Ekvall et al., 2000). In the conceptual model of Amabile et al. (1996) challenge originates out of the dimension of pressure. When pressures in the work environment and the tasks that are assigned to employees match with the intellectually challenging and urgent nature of problems, this will have a positive influence on the overall creativity in the organization (Amabile, 1988; Amabile & Gryskiewicz, 1987). According to Jones and Macfadzean (1997), work environments could be distinguished from others if employees are motivated to address products, procedures and processes in original ways and work on tasks that encourage them to challenge initial situations and assumptions. On the same line of argument, Hackman et al. (1975) have posited the effects of challenging and complex jobs on the motivation, satisfaction and eventually also the creative performance of individuals. In addition, challenging assignments arouse the freedom for individuals to focus on different facets of their work and stimulates their motivation to finish with success (Oldham and Cummings, 1997). Amabile (1998) continues by stating that challenge is probably the most effectual practice at the workplace. Managers need to select those tasks that cope with the individual's interests, creative thinking skills and domain-relevant skills to ignite intrinsic motivation, introduce some challenge in their work and nurture employee's creative outcomes (Amabile and Gryskiewicz, 1989; Siegel and Kaemmerer, 1978). For this, they need to be aware of both the detailed information on their employees as well as the available problems that need to be assessed. Such information is most of the time difficult to acquire and is time consuming. In addition, Amabile (1998) also addresses the importance of the stretch of assigned tasks. Challenging tasks, sufficient stretch, can enhance the individual ability of the employee while, on the other hand, boring tasks, and thus insufficient stretch, can narrow it down. Also Ahmed (1998) emphasize the importance of the amount of "stretch" that is required in a specific task. Moreover, he addresses the importance of hard work, value for getting things done, meeting commitments and avoiding bureaucracy in challenges and beliefs.

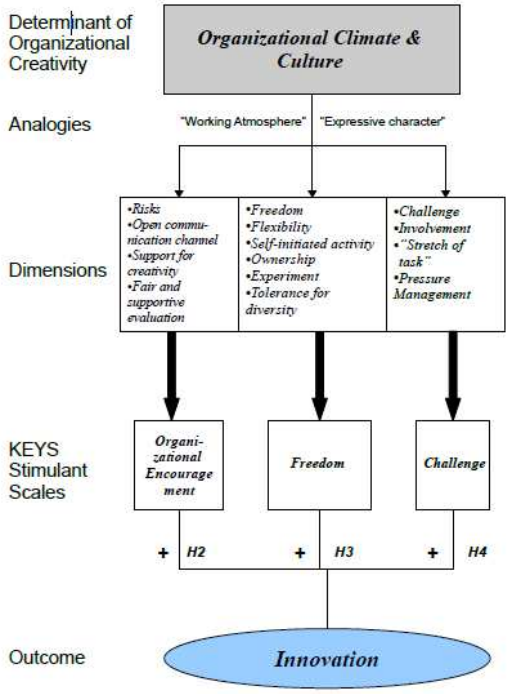
In this thesis, the above elucidated aspects are assessed by the stimulant scale of job challenge from the KEYS framework (Amabile et al., 1996). The dimension of job challenge evaluates the perception of employees on the contribution of personnel's creative efforts to the organization, the challenges they find in their daily activities and their perceptions on the utilization of their creative potential through work.

In line with the organizational creativity framework for product innovations examined in the thesis, Dutch SMEs that succeed in matching the tasks assigned to employees and the workload pressures in the work environment with the intellectually challenging and urgent nature of problems and arouse the freedom for individuals to focus on different facets of their work and finish with success are hypothesized in this thesis to flourish their product innovations. By this reasoning, the following hypothesis is thrown:

H4: *Dutch SMEs possessing higher levels of challenge in their organizational culture and climate are more likely to be involved in a product innovation.*

To emphasize this section, figure 1 will summarize the analogies, dimensions and stimulant factors of organizational climate and culture conducive to organizational creativity and their relationship with product innovations.

Figure 1: Conceptualizing the determinant of organizational culture and climate



3.1.2. Leadership Style

Although there seems to be a consensus that creative performance of individuals stems from multiple interactions between creativity facilitators and their social environment – the work context as expressed by organizational climate and culture -, the role of leaders or managers in this dynamic process seems to be uncontested and significant (e.g., Amabile & Gryskiewicz, 1987; Amabile et al., 2004). Leaders can be regarded as the steering wheel of organizations as they are trying to lead the organization to success and survival. In this, the personality, perceptions, relationships and vision of leaders plays an important role (Oldham & Cummings, 1996; Scott & Bruce, 1994). According to Locke and Kirckpatrick (1995), the leader's vision stands at the heart of directing creative individuals. The leader's vision determines how the organization could and should be positioned in the future and expresses a transcendent goal that emphasizes the purpose of existence for organizations. Overall, a supportive leadership style seems to be elevating levels of individual and team creativity. In their study on creativity within groups and teams, Mumford et al (2002) found evidence to suggest that higher levels of creativity were obtained when group members could count on sufficient amounts of leadership support. Closely related, Amabile et al. (1996) came to the conclusion that the shared perception of supervisory support of organizational members directly relates to the accomplishments of teams in creative undertakings. According to Elkins and Keller (2003), leadership style is a confluence of vision, support for creativity and innovation, encouragement, autonomy, challenge and recognition, determinants that are most often mentioned to foster creativity in work environments. In addition, Elkins and Keller (2003) emphasize leader's behaviour as "creativity-enhancing forces" for the organization. To summarize, the personality, perception, relationships and vision of leaders determines to which extent creativity is acknowledged as an important facet of the day-to-day operations of organizations and the amount of stimulation and encouragement given to employees in unlocking their creative potential.

At this point, there is still a lot of confusion regarding the exact type of leadership that fosters the creative performance of individuals (Sternberg et al., 2003). Since leaders are perceived to be extremely different and organizational environments are continuously evolving and changing, numerous overlapping types of leadership have been proposed to cultivate a creative work environment under different names. For example, in the transformational leadership model that was firstly introduced by Burns (1978) and extended

by Bass and Avolio (1995) four components of leadership are introduced that are closely related to the creative performance of their followers (e.g., employees, members); charismatic role modeling, individualized consideration, inspirational motivation and intellectual stimulation. The leadership style of charismatic role modeling inspires followers to have a shared sense of vision and encourages respect, loyalty and admiration. Individualized consideration provides a level of recognition and encouragement to followers and serves as a significant reward for follower's involvement and contributions in creative efforts. Inspirational motivation encourages followers to be involved in the process of idea generation incorporating the long term vision of the organization (Bass and Avolio, 1995; Sosik et al., 1998). At last, intellectual stimulation serve as a stimulant for followers to be involved in divergent thinking as they can exert sufficient freedom and feel challenged and support for the generation of new ideas and procedures. As in the componential model of Amabile (1983), the leader's practices in the transformational leadership model enhance creativity through a stimulation of intrinsic motivation within all employees. In addition, Bass and Avolio (1995) stress the importance of self-efficacy among followers for creativity and accentuate that transformational leaders are able to develop this phenomenon and encourage and motivate the process of novel and applicable idea generation (Bass, 1990). All these components improve on the day-to-day relationships between leaders and followers and as Hunt et al. (2004) posture this will inhibit the levels of joy and emotional involvement of followers and will probably respond in higher levels of individual and team creativity.

As the model of Bass and Avolio (1995) only elaborates on the levels of individual and team creativity, Gumusluoglu and Ilsev (2009) extended this model and examined both the effects of transformational leadership on individual as well as on creativity in an organizational context. They found positive relations between all these levels of analysis and transformational leadership and emphasize in particular the effects of leadership on psychological empowerment of employees.

In most of the proposed models for leadership as conducive to creativity within business organizations there seemed to be a consensus that leaders at least must possess a number of elements to nurture organizational creativity. The most common behaviours of leaders as positive correlates of employee creativity are for example providing supportive feedback, extensive social support, autonomy, concern for employee's feelings and skill development (Amabile, 1998; Amabile et al., 2004; Oldham and Cummings, 1996).

According to Nystrom (1979), democratic and participative leaders dominate more autocratic ones in the process of organizational creativity. As elaborated above, the leader's vision plays a more than significant role in the process of connecting with followers and directing them in their idea generation process. Bowven and Fry (1988) accentuate that it is not sufficient for leaders to avoid paradigms and systems that are known to impede creativity; it is of major importance to be totally involved in the management of ideas. However, some authors have also emphasized that leaders need to possess a significant amount of communicative skills in order to render their vision on to their subordinates through both formal and informal channels in all domains of the organization (Cook, 1998; Delbecq and Mills, 1985; Kimberly and Evanisko, 1981). In addition, leaders must be able to inspire employees to emphasize new and original perspectives beyond the current knowledge base. Interestingly, Oldham & Cummings (1996) proved that non-controlling supervisory support is positively related to creativity in organizational context.

More recently, authors also assigned effective group composition as a necessary condition for leadership to be conducive to levels of organizational creativity (Woodman et al., 1993; Amabile and Gryskiewicz, 1989). Effective work groups encompass a variety of diverse individuals from different backgrounds and possess a mix of skills and knowledge. In addition, effective work groups are known to communicate openly and foster knowledge sharing. By combining their diverse knowledge and skills, group members are better able to emphasize problems from new perspectives and produce novel and applicable solutions to these problems. In order to constitute efficient groups, leaders must have acquired sufficient amounts of information on every group member and relate on both informal and formal relationships (Amabile, 1998). The closer connection between leaders and followers facilitates the process of balancing practices such as freedom and ownership without over emphasizing control and domination. On a continuing note, leaders need to recognize and concern the needs and feelings of employees and groups, reward and notify creative work, motivate employees to be critical and extravert concerning their concerns, provide feedback and accelerate learning processes (Amabile, 1998; Pelz, 1956), components of leadership that were also postured in the transformational leadership model (Avolio & Bass, 1995).

To sum up, the literature suggests several important qualities of leaders in the search for a creative social work environment. Leaders need to possess a clear vision and align this with the goals of the company and the wishes and needs of individuals and teams. In addition,

they need to be able to communicate this vision and build a strong relationship with every team member in order to secure a work environment that is perceived to be free of criticism and supportive to new ideas. In this, key characteristics for leaders regarding their employees seem to be charisma, stimulation, participation or consideration and motivation. At last, leaders must be able to constitute effective work groups characterized by a mix of talents, abilities, knowledge and backgrounds in order to tackle problems in an original and appropriate way.

The above explained dimensions of leadership style as supportive to organizational creativity are conceptualized in this thesis as the stimulant scales of supervisory encouragement and work group support from the KEYS framework of Amabile et al. (1996). The stimulant scale of supervisory encouragement evaluates perceptions of employees on three main aspects that are broadly mentioned in the above discussion and literature to be conducive to creativity. (1). Goal clarity (2). Open interaction between supervisors and subordinates and (3). Supervisory support for the work and ideas of the team. Since the creative process is extremely dynamic, the need for exact problem definitions implies the critical role of goal clarity for creative performance (Getzels and Csikzentmihalyi, 1976). Employees prefer work environments free of criticism and to enhance their intrinsic motivation an open relationship between employees and leaders together with perceived support of creativity is required (Amabile, 1979, 1983). The stimulant scale of Work group support originates out of five important aspects elucidated above, namely encouragement of the work group itself, diversity in the talents, knowledge and background of team members, causal openness to ideas, constant challenging of ideas and mutual commitment to projects (Albrecht & Hall, 1991; Andrews, 1979; Monge et al., 1992; Payne, 1990). These aspects of work group support are known to increase both the levels of intrinsic motivation and creative thinking skills since team members are exposed to a rich and original melting pot of fuzzy and unusual ideas and feel challenged and focused in their day-to-day activities (Parnes & Noller, 1972; Amabile et al., 1994).

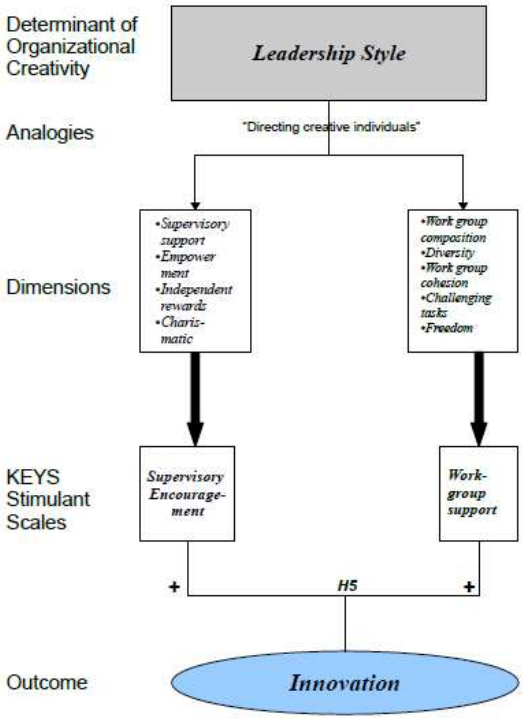
In line with the organizational creativity framework for product innovations tested in this thesis, Dutch SMEs are expected to enhance their product innovations when leaders are able to communicate and render their vision on to employees and provide supportive feedback, extensive social support, autonomy, concern for employee's feelings and skill development (Amabile, 1998; Amabile et al., 2004; Oldham and Cummings, 1996). In

addition, leaders need to connect with employees, align assignments in concordance with expertise and thinking skills and be able to compose heterogeneous work groups. By this reasoning, the following hypotheses are formulated:

H5: *Dutch SMEs possessing higher levels of supervisory encouragement and work group support in their leadership style are more likely to be involved in a product innovation.*

To summarize this section, figure 2 will demonstrate the analogies, dimensions and stimulant factors of leadership style as conducive to organizational creativity and their relationship with product innovations.

Figure 2: Conceptualizing the organizational determinant of Leadership style



3.1.3. Organizational culture and climate and Leadership style

Having emphasized the determinants of culture and climate and leadership style as influential to levels of organizational creativity in SMEs as well as their impact on the realization of product innovations, there seems to be concrete indirect and direct causal pathways between the two concepts and their relationship to both organizational creativity and innovation. According to Howard (1998), strong organizational cultures and climates impact decisive processes of leadership, decision making, performance, internal development and strategic development within SMEs. Organizational cultures and climates determine the shared beliefs and assumptions and influence the mission, vision and strategy of SMEs (Martins and Terblanche, 2003). Moreover, strong organizational cultures and climates play a prominent role in levels of risk taking, autonomy, challenge and organizational encouragement to creativity and innovation (Woodman et al., 2003; Amabile et al., 1996;). Strong leaders, on the other hand, are known to establish fertile organizational cultures in which innovations are able to flourish (Martensen, 1998). In addition, leaders also determine to which extent employees are given latitude in their work and creative ideas are supported and encouraged. As said by Elkins and Keller (2003), leadership style is a confluence of vision, support for creativity and innovation, encouragement, autonomy, challenge and recognition. Hence, from the above, on the one hand, the set of shared beliefs, assumptions and feelings and the determined working atmosphere as manifested by the organizational culture and climate seem to influence the vision and behaviour of leaders and the type of leadership that is preferred within the SME. On the other hand, the vision and behaviour of leaders seems to determine the myriad of motivational forces manifested by the organizational culture and the amounts of freedom and challenge exerted within the working atmosphere. Hence, a clear positive relationship thus exists between organizational culture and climate and leadership style and the levels of organizational creativity. And, although organizational cultures and climates are known to be deeply rooted in the systems of employees (Pheysey, 1993) and leadership styles are regarded to be aligned with the common forces, assumptions and moods as manifested by the culture and climate, it is assumed in this thesis that the confluence of both determinants has a stronger effect on the realization of product innovations than the effect of their separate parts. By this reasoning, the following hypothesis is formulated:

H6: *The synergy between a strong organizational culture and climate and supportive leadership style increases the likelihood for Dutch SMEs to be involved in a physical end product service innovation.*

3.1.4. Resources & Skills

Resources & Skills comprises out of the immense collection of tools and instruments the organization has at its disposal to operationalize daily activities. It consists not only out of physical assets such as machines, materials, equipment and capital, a more influential and complex element of resources and skills embodies the human capital of the organization such as the knowledge, abilities and talents embedded within individuals and the patents and copyrights employed by the organization. The importance of human or intellectual capital for vital organizational goals such as maintaining a competitive advantage, innovation and organizational survival is definitely incontestable. In addition, there is a consensus among scholars that the ideas and knowledge of creative employees are regarded as vital business assets (Amabile, 1997, 1998; Smolensky and Kleiner, 1995).

Straightforwardly, organizations who wish to facilitate creative outcomes are also required to strategically allocate their human resources (Cohen & Levinthal, 1990; Damanpour, 1991; Kanter, 1983). Koslow et al. (2006) emphasize that allocating significant or at least adequate resources to individuals play a more than vital role in the creative process. As postured by Cook (1998), creative organizations can remain competitive only if they succeed to attract, develop and retain a significant base of human capital. Brand (1998) also emphasizes the importance of intellectual capital for organizational creativity as he suggests that creative organizations should consists out of knowledgeable, intelligent and at all times creative individuals who are able to address problems and solutions in innovative ways. Since human resources are embedded within people, organizational creativity, and more specifically balancing the resources and skills to nurture organizational creativity, is concerned with developing and retaining individuals in an efficient way. According to a study by Amabile and Gryskiewicz (1989) the most important resources for developing and retaining individuals in their search for creativity involves a complex set of elements including time allocation for contemplating original ideas, significant funding, material resources and the availability of relevant information. Closely related, Shalley et al. (2004) denote the

prominent role of a wide scale of resources consisting of knowledge, information, time, funds and tools.

On the same line of argument, several authors have emphasized the importance of slack (or loose) resources for the proliferation of organizational creativity (Cohen and Levinthal, 1990; Damanpour, 1991; Van de Ven, 1986; Ahmed, 1998). Slack resources have been defined as the redundancy or excess of employees, capacity and capital expenditures after a given level of organizational production is obtained. According to Kamin and Roonen (1978) slack resources can be deployed by organizations to respond to uneven performance. In addition, slack resources serve as a response to environmental jolts (Meyer, 1982) and facilitate experimentation (Levinthal and March, 1981). So why do slack resources enhance creative performance of business organizations? Slack resources are known to foster a culture of experimentation as they prevent organizations from the unexpected success of projects (Bourgeois, 1981) and encourage organizations to choose for safe strategies entering new markets and implementing new products (Moses, 1992). Moreover, slack resources motivate the pursuit of fuzzy and unoriginal ideas and may result in an increasing pace of projects. Although these projects often fail they may indirectly be beneficial to the firm in the form of new and original perspectives to problems (Levinthal and March, 1981). A good example of slack resources is the post-it case of 3M in which slack search resulted in a revolutionary innovation (Mokyr, 1990).

By investigating further on these resources and their importance for organizational creativity, Amabile (1998) emphasizes only time and money (in the form of wages) as creative facilitating resources. As in the process of finding challenging task that cope with the interests and skills of individuals, carefully allotting the resources of time and money to individuals and teams is also regarded as an aesthetic judgment call that can either nurture or impede creative performance. Managers carefully need to evaluate how to set time pressures and money rewards. Concerning the complexity of time pressures, Amabile (1998) proposes an ambiguous effect of time allocation on the creativity performance of employees. On the one hand extreme time pressures elevate creativity by signalling the immersive need of creative contributions and stressing the importance of their work. Moreover, tight deadlines could create situations in which employees utilize their full creative potential. On the other hand, impossible and fake deadlines can impede the creative outcomes of employees since the process of finding unique concepts to problems asks a significant amount of time and

employees might feel controlled and stressed (Shalley et al., 2000). All the above dampens the intrinsic motivation of employees and indirectly also their creative outcomes. For money rewards almost the same holds. Before managers compromise on how much to spend on an assignment they must not only be aware of the exact budget the organization has at its disposal, also they must know which people and other resources should be allocated to succeed an assignment. Amabile (1998) says that "interestingly adding more money rewards above a "threshold of sufficiency" does not boost creativity. Below that threshold, however, a restriction of money rewards can dampen creativity" (Amabile, 1998, p. 82). According the intrinsic motivation principle of individual creativity (Amabile, 1998), high money rewards for creative efforts encourage employees to work for extrinsic purposes such as competition and money and dampen intrinsic motivation since employees forget the passion for their work. This may lower the ability of employees to be inventive and come up with new perspectives to problems. Almost the same holds for project budgets. In case of tight budgets, employees will be on the lookout for additional budget instead of their quest for problem solving and the development of new products and ideas. Based on the above, an optimal allocation of resources and skills in relation to product innovations is propositioned. To test this statement, the following hypothesis is postulated:

H7: *There is an inverted U-shape relationship between the allocation of resources and skills and product innovations of Dutch SMEs*

The explained elements of resources & skills as conducive to creativity are conceptualized in this thesis by the stimulant scale of resources from the model of Amabile et al. (1996). As mentioned above in the study of Amabile (1998) the most vital resources for organizational creativity are time and money. The stimulant scale of resources evaluates perceptions of employees on resource allocation, resource restrictions and the overall adequacy of resources. Resource restrictions are known to impede the creative performance since work accomplishments are significantly controlled and employees sense a lack of ownership and freedom over their work. An overall adequacy of resources has a stimulating effect on the intrinsic value that is assigned to employees work.

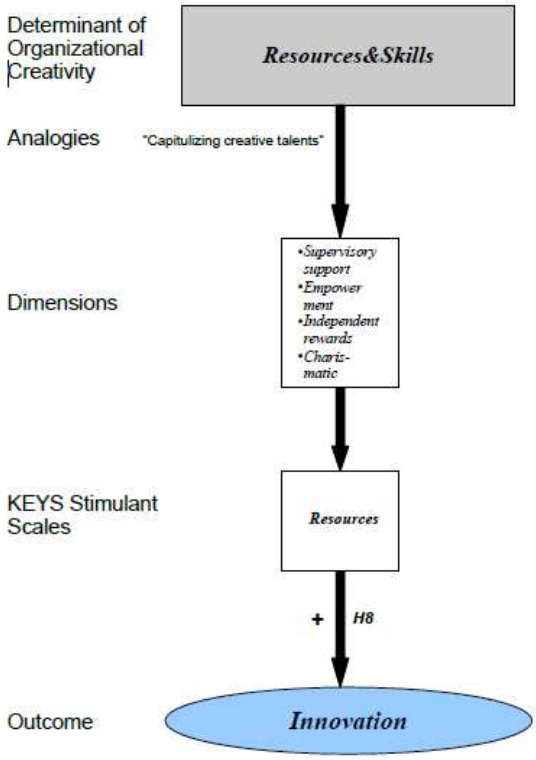
In line with the organizational creativity framework for product innovations proposed in this thesis, Dutch SMEs are regarded to realize product innovations when carefully

allotting the resources of time for contemplating original ideas, significant funding, material resources and the availability of relevant information in which employees are triggered to utilize their creative potential, stimulated to perceive time and money pressures as a signal of involvement and encouraged to look for new perspectives and methods to solve problems. By this, the following hypothesis is thrown:

H8: *Dutch SMEs possessing higher levels of resources in their resources and skills are more likely to be involved in product innovation.*

To elucidate this section, figure 3 will summarize the analogies, dimensions and stimulant factors of resources and skills conducive to organizational creativity and their relationship with product innovations of Dutch SMEs.

Figure 3: Conceptualizing the organizational determinant of resources and skills



3.2. Barriers to Organizational Creativity in SMEs

As elucidated at the beginning of the previous section, the complex inquiry of organizational creativity implies that the numerous interactions between parameters in the organizational setting might have a negative effect on the creative performance of organizations and in particular individuals. In every determinant of organizational creativity, numerous dimensions were emphasized to be at the heart of creative outcomes, upon the condition that in every arena of the organization (e.g., culture and climate, leadership style and resources and skills) creativity is acknowledged and prioritized as a significant organizational resource and all the members are motivated and encouraged to inhale creativity and address problems and solutions in innovative ways. Due to the complexity of finding this creative balance, organizations might hamper the creative process of their members. Just to mention a few examples, the previous section on organizational culture exposed that several authors have proposed a paradox in the organizational culture as conducive to organizational creativity: since the shared assumptions and routines, determined by the organizational culture, led to success in the past, they are no longer questioned and taken for granted. Over time, these unquestioned priorities may lead to routinized behaviour and this might dampen creativity and lead to a possible hindrance of learning and development (Glor, 1997; Tuskman and O'reilly, 1997; Barret, 1998). Since the culture of an organization can strongly affect the behaviour of its employees, values, beliefs and assumptions of employees can become too deeply implemented in their mindset and it is hard to change them in the case of a, until then, good performing organization (Tan, 1998) In addition, Ahmed (1998) and Amabile (1998) accentuated that although organizations seem to appreciate a constant flow of new and original ideas, their reluctance for change and a departure from the status quo could restrain them from the encouragement of risk taking and this will eventually also impede creativity.

On a continuing note, Amabile (1998) emphasized that the strive of managers for the so called business imperatives – control, productivity and coordination – in their leadership style has a negative effect on the creative-thinking skills, domain-relevant skills and mostly the intrinsic motivation of employees. In addition, Tan (1998) accentuates the hindrance of creativity due to leadership styles that neglect risk-taking and experiments, kills ideas in a premature stage and controls feedback from the base. Moreover, Amabile (1998) notes the ambiguous effects of both time pressure and money rewards as elucidated above. To sum up,

in all of the elaborated determinants to organizational creativity there is some sort of threshold for which the determinants can suddenly change into organizational barriers to creativity.

To address the above proposition, Amabile (1998) complemented on the stimulant scales in the KEYS framework by stating how, in all the research she has done over the years, organizations in her environment actually turned out to kill creativity and changed the stimulant scales in obstacle scales. Amabile (1998) recognized that creativity killing behaviour is seldom the result of practices of managers; instead, practices that impede creativity are most of the time caused by systematic approaches. As in organizational culture, these practices become so systematic that they are not questioned anymore.

Still, there seems to be a tendency among scholars to focus explicitly on creativity supports, which are factors in the work environment that nurture organizational creativity, instead of emphasizing the factors that hamper creativity (Amabile et al., 1996). This is also supported by Unsworth (2001) stating that little has been done to investigate on the barriers that impede creativity from taking light inside organizations. Besides from a study within R&D laboratories by Amabile and Gryskiewicz (1987), to my best knowledge only three quantitative studies have examined organizational impediments to creativity (Kimberly, 1981; Kimberly & Evanisko, 1981; Asad Sadi and Al-Dubaisi, 2008). Kimberly (1981) and Kimberly and Evanisko (1981) address the impediment issues of conservatism, internal competition and strict, formal management issues on the creative performance of employees. In addition, Asad Sadi and Al-Dubaisi (2008) investigated on the barriers to creativity of risk taking, task achievement, need for conformity, use of the abstract, use of systematic analysis and physical environment and accentuate task achievement as the most significant barrier to creativity and need for conformity and risk taking as the least significant impediment to creativity.

Having mentioned the minor barriers to organizational creativity known in today's literature, this thesis will try to take into account the above discussed elements of organizational barriers to creativity by conceptualizing them as the obstacle scales of workload pressures and organizational impediments to creativity from the KEYS framework of Amabile et al. (1996). Workload pressures evaluates the perceptions of employees on time pressures, distractions external to main projects and realistic expectations of supervisors on targets and other deadlines. As mentioned in the section on challenging tasks (chapter 3.1.1), there is a thin line for which time pressures can either impede or enhance creative

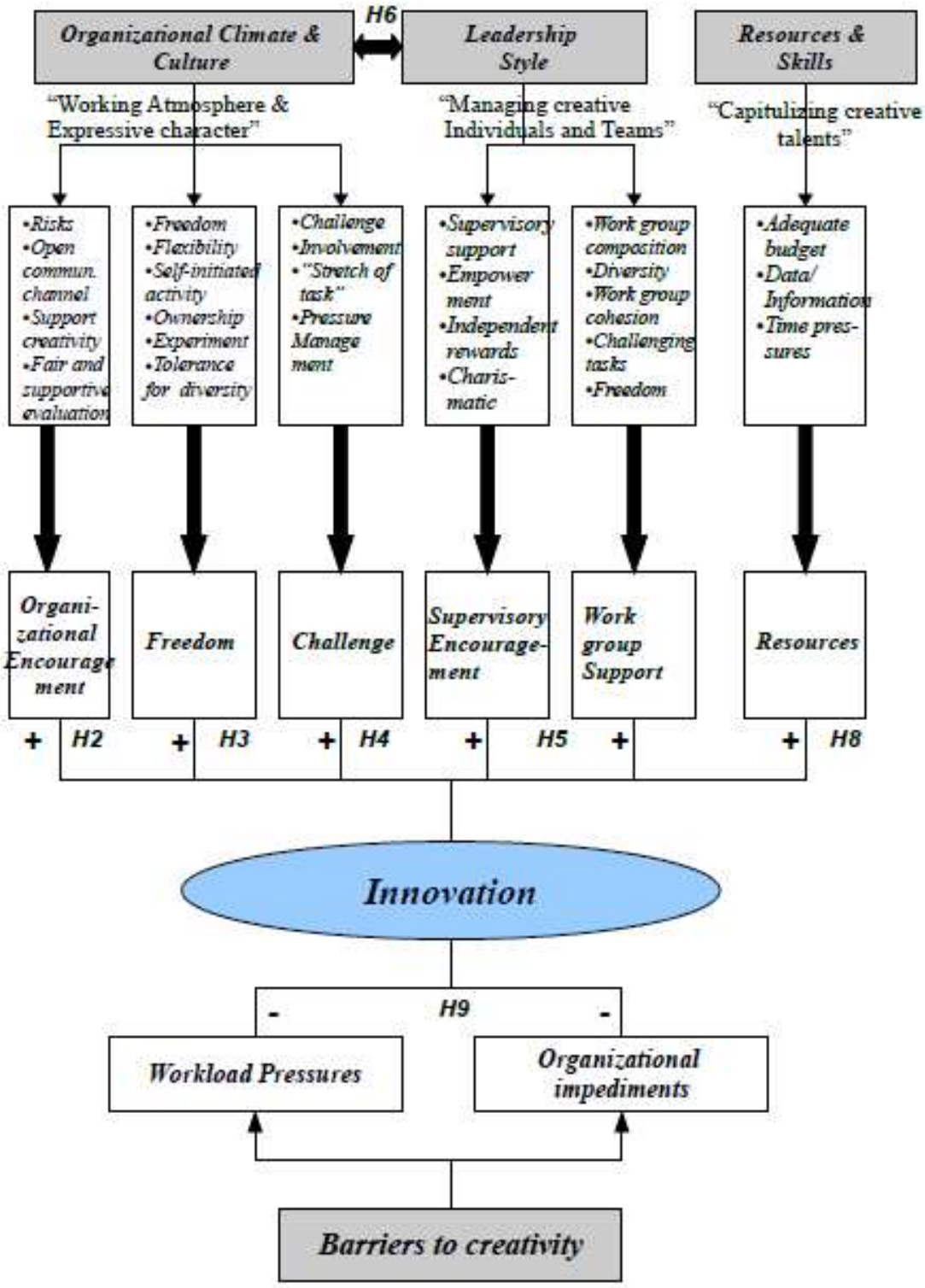
performance. When time pressures are perceived as a gesture of control and coordination they will undermine the intrinsic motivation of employees and dampen creativity (Amabile, 1993). The obstacle scale of organizational impediments to creativity evaluates the perceptions of employees on the acceptance of status quo of top management, defence of specific territory, destructive competition, risk-averse behaviour of top management and destructive criticism within the organization.

In line with the organizational creativity framework for product innovations proposed in this thesis, Dutch SMEs are expected to realize product innovations when they succeed in lowering overall systematic approaches, degrees of conservatism, levels of internal competition and strive, encourage informal over formal top management and create work environments in which supportive criticism and fair evaluation systems are enhanced and participative safety is guaranteed. By this reasoning, the following hypotheses are formulated:

H9: *Dutch SMEs possessing lower levels of organizational impediments and workload pressures in their barriers to organizational creativity are more likely to be involved in a product innovation.*

To summarize the above section and the entire theoretical framework, figure 4 displays the organizational creativity framework for product innovations.

Figure 4: Organizational creativity framework for Product Innovations



4. EMPIRICAL PART

In this section, the data and methodology is outlined and the consecutive results of the empirical research is displayed and evaluated to examine the hypotheses from the theoretical framework and shed a light on the central research topic in this thesis. First, information on the sample and data collection is given. Second, the dependent, independent and control variables are explained. Third, the different models used for hypothesis testing are illustrated. At last, the statistical results are illustrated and interpreted.

4.1. Data collection and Sample information

As mentioned in the introductory chapter, the data for this study was collected together with fellow master student S. Maarseveen and consists of 120 SMEs, 60 innovative SMEs and 60 SMEs representing the control group. The data collection and herewith the Master thesis was an extension of the Scientific Research Project conducted for study association EUREOS. We decided to use a platform from which we knew that the SMEs would be both diverse and innovative namely the Dutch Syntens innovation platform. This platform each year awards the most innovative SMEs from a constructed list of 100 firms.

The data is collected through an internet based questionnaire (Global Park Software) which offers the opportunity to build a questionnaire with different 'paths' omitting question which were not relevant for the firm and bringing down response time. The average response time of the innovative SMEs was 15 minutes.

The data collection on the innovative group started in April 2010. 100 SMEs from the Syntens innovation top 100 award 2010[6] were contacted by email with a personal link to the questionnaire. Since these SMEs were acknowledged as the driving force behind innovation in the Netherlands, this group was expected to be flattered to participate in the study and, hence at least 60 of these 100 SMEs to were expected to participate. After two weeks, all these SMEs were again contacted by a follow up mail. A lot of positive responses were received and SMEs replied by saying that the survey would be filled in by the end of the week. However, in May 2010, only 10 SMEs filled in the survey and as an emergency option the same procedure was conducted for the SMEs from the Syntens innovation top 100 award 2009. In June 2010, in total 200 SMEs were contacted by email and only 15 SMEs decided to

[6] http://www.syntens.nl/innovatietop100/top-100-2010/top-100-2010.aspx

participate in the study. Half June, another 200 SMEs from the top 100 innovation award 2007 and 2008 received the internet link. In July 2010, 400 SMEs were contacted by email and 30 SMEs had participated in the study. Due to holidays, the data collection started again in September 2010. To speed up the process and increase the response rate, a new approach was chosen. Instead of inviting SMEs by emails, the remaining SMEs (out of 400) were personally contacted by telephone and asked to fill in the survey directly. In addition, while on the phone the option was given to fill in the survey before the end of the week. The new approach turned out to be more effective. The data for the innovative group of 60 SME was collected at the end of September 2010 with a response rate of 15% (60 out of 400 SMEs).

Hereafter, data had to be collected from another 60 SMEs representing the control group. The aim was to gather data from firms with the same characteristics as the 60 "innovative" firms. The 60 innovative firms were scattered throughout the Netherlands and very diverse in industries e.g. ranging from food related firms to consultancy firms. As we were behind schedule due to the slow response of the firms the decision was made to contact SMEs from the Gouden Gids randomly yet with a focus on Rotterdam and surroundings. Reason for this was the presumed association with the Erasmus University and the fact that we could invite them for the symposium on innovation which we arranged during our project and in this way encourage them to participate. To our delight we noticed that these firms were willing to cooperate more efficiently and by the half of October we gathered data from 30 SMEs. To speed up the process again we contacted the remaining firms by phone and at the end of October 2010 we had data from 60 SMEs from a pool of 300 firms with a response rate of 20%. In total, 120 SMEs participated in our research from a pool of 700 firms leaving us with an average response rate of 17.1%.

To create an organizational profile for the SMEs, questions were asked on size, age, type of industry and independency (see section 4.3.3. on control variables). The questions for hypotheses testing are extracted from the KEYS to creativity instrument (Amabile et al., 1996) introduced and explained at the beginning of chapter 2 and consists of 32 likert-scale questions. Based on the theoretical framework in the previous chapter, the questions and dimensions from the KEYS to creativity framework (Amabile et al., 1996) were assigned to the different determinants and barriers to organizational creativity (see section 4.3.2. on independent variable). As mentioned, the KEYS instrument assesses the 'total work environment' perceptions of individuals for every given organization and focuses on

organizational practices and routines plus those of supervisors and managers that have a significant influence on and encourage creativity and innovation. It aims at identifying the particular areas in the organization that turn out to nurture or dampen individuals from working at their highest creative potential. The KEYS framework is emphasized to be fully focused on organizational creativity, delivers the highest scientific quality and is above all well documented (Sorensen, 2009).

Concerning sample information, Table 2 displays the descriptive statistics of the innovative and non-innovative SME on the general characteristics of the two groups.

TABLE 2
Descriptive Statistics on the Organizational profile of Dutch SMEs

	Total	Innovative	Non Innovative	
	(N=120)	*(N=60)*	*(N=60)*	
		Averages		p-value
Age	21 years of existence	23 years of existence	19 years of existence	,373
Size (# of employees)	17 employees	18 employees	16 employees	,363
Independent	73%	72%	75%	,683
Sector Industry	35%	48%	22%	,002
Sector ICT	18%	18%	18%	1,00
Sector Health and Medical care	9%	7%	12%	,347
Sector Advisory	18%	15%	22%	,350
Others	19%	12%	27%	,037

Remarkably, the organizational profiles of the innovative and control group in the dataset seem to coincide almost perfectly. The results show non-significant mean differences for the control variables age, size and independency (with corresponding p-values of 0,373, 0,363 and 0,683). Innovative SMEs turn out to be slightly older, depicting 23 years on average against 21 years for the control group. Also for size, the dataset shows minor differences between innovative and non-innovative SMEs in the Netherlands. On average, 18 employees were working within the innovative SME whereas the control group utilized 16 employees in their workplace. Concerning the structure of the Dutch SME, 72% of the innovative SMEs turned out to be independent against 75% of the non-innovative SME. For type of industry, the data shows significant mean differences for the sectors of industry (p-value of 0,02) and others (p-value of 0,037). This is explained by the large share of the innovative group of SMEs in the sector industry (48% against 22% for the control group) and

the large number of non-innovative SMEs operating in other types of industries (27% against 12% for the innovative SMEs). For the non-significant mean differences, the innovative and non-innovative groups of SMEs are equally represented in the sector ICT (18%) and non-innovative SMEs are slightly overrepresented in the advisory sector (22% against 15%). Based on the results elucidated above, the characteristics of the control group seem to be quite identical to the profile of the innovative group and this may also 'downplay' the influences on the explanatory variables and enhances the validity and reliability of the data used in this thesis. It has to be noted that the figures in table 2 are averages from our dataset which include some outliers on size and age. When controlling for these few firms the averages are in accordance with the country averages as given by the European Commission SME monitor[7]. Among others, these figures show that 91.8% of Dutch SMEs consist out of micro firms employing 10 or less workers and thereby accounting for 29.7% of the total employment. Furthermore, EU stats show that approximately 25% of the SMEs are dependent on a sister organization or larger firm which coincides with the figures from our dataset.

In addition, as mentioned previously, all innovative Dutch SMEs in the sample were evaluated by guidelines of the Syntens innovation MKB top 100 and the General Entrepreneurial Monitor (GEM, 2009). Following the approach of Koellinger (2008), Dutch SMEs showing imitative innovations were removed from the dataset and as a result only SMEs with incremental to radical product innovations were examined (see section 4.2.1. on dependent variable). 51% of the product innovations of SMEs in the study were based on a technology or patent that was not available for more than two years. Concerning costumer perception, 60% of the innovative Dutch SMEs expressed all of their (potential) customers to perceive their innovation as new and unknown. In addition, there were remarkably no innovative SMEs who stated that none of their (potential) customers would perceive their product innovation as new and unknown. Regarding the imitative behaviour of competitors, around 45% of the innovative Dutch SMEs believed that there were no other competitors offering the same product or service to the target group of costumers. Moreover, only a small group of SMEs stated that many competitors were currently utilizing the same product or service innovations (11%). This has resulted in the following percentages on the degree of innovativeness of Dutch SMEs. Around 23% of the innovative SMEs based their product

[7]http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/pdf/final/sba_fact_sheet_netherlands_en.pdf

innovation on a radical improvement utilizing a relatively new technology (no longer available than 2 years), offering a new and unknown product/service innovation to all (potential) costumers and operate in a market where no other competitor is currently offering the same product/service to the target group of costumers. In addition, around 74% of the product innovations were in between radical and incremental.

4.2. Variables

In this section, the set of variables and their measurements are discussed. First, the requirements and evaluation of the dependent variable in this thesis is discussed. Second, the explanatory variables are introduced and their reliability is examined and finally the control variables that make up the organizational profile are considered.

4.2.1. Dependent Variable

As mentioned in the introduction, one of the objectives of this study was to clearly define the innovation dependent variable. As the Oslo Manual (2005) states, the broad use of the definition innovation and addition of different types implies that an increasing percentage of firms meet the basic requirements to be innovative. Therefore, following previous research of Becheikh et al. (2006), a more tangible form was chosen in the form of actually commercialized product innovations from the Syntens innovation top 100 award[8]. In contrast to for example social innovations, the validity of this measurement will be significantly higher since its meaning is more clearly interpreted. Also, taking into account the commercialization aspect has shown to be an important determinant of innovative performance in the literature (Fagerberg, 2005; Krebbekx et al., 2006). Having said this, the binary dependent variable in this thesis is captured by the question if the SME was involved in a product innovation in the last two years (YES/NO).

To assure that no imitative innovations were included in the dependent variable, three questions from the Global Entrepreneurial Monitor (GEM, 2009) were included as presented in table 3. Following the approach of Koellinger (2008), SMEs that answered T1, C3 and M1

[8] Innovations were selected on: impact for sector and society, originality, availability, degree of protection and amount of realized turnover. For more information visit: http://www.syntens.nl/innovatietop100/top-100-2010/top-100-2010.aspx

were regarded as having an imitative innovation and not included in the product innovation dependent variable. The other options of answers serve for descriptive purposes and refer to the degree of innovativeness of the product innovations. Product innovations are regarded as radical for T2, C1 and M3 and for all other options, the innovation is classified as being in between incremental and radical.

TABLE 3
Survey questions on innovativeness

Survey question	Answer categories
T – "Were the technologies or procedures required for this product or service generally available more than three years ago?"	T1 – Yes T2 – No
C – "Will all, some or none of your (potential) customers perceive this product or service new and unknown?"	C1 – All C2 – Some C3 – None will consider this new and unknown
M – "Right now, are there many, few or no other competitors offering the same products or services to your target group of customers?"	M1 – Many competitors M2 – Few competitors M3 – No competitors

Source: Global Entrepreneurship Monitor (GEM)

4.2.2. Explanatory Variables

As stated previously, the explanatory variables have been extracted from the KEYS instrument of Amabile et al. (1996). The KEYS instrument measures the total work environment perceptions of employees concerning the overall organizational creativity. Based on the theoretical framework, the six stimulant scales have been assigned to the subsystems of organizational culture and climate, leadership style and resources and skills and the obstacle scales to the barriers of organizational creativity. Organizational culture and climate consists of the stimulant dimensions of organizational encouragement to creativity, freedom and challenge. Leadership style consists of supervisory encouragement to creativity and work group support. Resources and skills are confined by resources and the barriers to organizational creativity are obtained by organizational impediments to creativity and workload pressures. Since the instrument was already validated by Amabile et al. (1996), a

factor analysis of the data was conducted (maximum likelihood) on the eight stimulant and obstacle scales from the KEYS framework (Amabile et al., 1996). The reliability of the KEYS framework is obtained by the Kaiser-Meyer-Olkin measure of sampling adequacy. KMO test gives a score of, 859 indicating a perfect reliability of the sample (Kaiser, 1974). Below the measurement and reliability of the dimensions within the determinants and barriers to organizational creativity from the KEYS framework will be exposed and the self-constructed measurements of organizational culture and climate and leadership style for hypothesis testing will be explained.

Organizational culture and climate

Within the organizational culture and climate, the dimension of organizational encouragement (hypothesis 2) is measured and added to model 1 as the mean score of 6 likert scale questions on the perceptions of employees on aspects of risk taking, open communication channels, fair and supportive reward and evaluation systems and the encouragement of new ideas within the work environment, freedom (hypothesis 3) is added to model 1 as the mean score of 3 likert scale questions on project autonomy, the freedom to switch between projects and the amount of control that is exerted over the work of personnel. Scores for the latter question have been reversed for reasons of consistency since lower scores on this question coincide with higher levels of organizational creativity within work environments. At last, challenge (hypothesis 4) is measured and added to model 1 as the mean score of 3 likert scale questions on the total work environment perceptions of employees on the contributions of personnel's creative efforts to the organization, the challenges they find in their daily activities and their perceptions on the utilization of their creative potential in projects. All these aspect could be rated on a scale of 1 to 5 (1 = totally disagree, 2 = partly disagree, 3 = neutral, 4 = partly agree and 5 = totally agree). Example of an item in the organizational encouragement scale is: *In this organization there is a lively and active stream of ideas*. Example of an item in the freedom scale is: *I have the freedom to decide how I am going to carry out my projects.* Example of an item in the challenge dimension is: *I feel that I am working on important projects.* Reliability analysis using Cronbach alpha (α) for the three dimensions within the determinant of organizational culture and climate yields the following Cronbach α's: (1) Organizational encouragement (α = .83), (2) Freedom (α = .60) and (3) Challenging work environment (α = .73), which are high alpha values indicating that

the items measure the same phenomenon as in the KEYS instrument (see Nunnally, 1978 - rule of thumb: alpha values from 0,6 and higher). Moreover, to test the propositioned relationship of decreasing returns between organizational culture and climate and product innovations (hypothesis 1) and the causal pathways between leadership style (hypothesis 6) and innovation, the variable ORG_CUL_CLI is constructed. To increase the reliability of this broad variable, the comparable items within the organizational culture and climate from the literature review of Andriopoulos (2001) are chosen as a benchmark as presented in table 4 and are widely discussed in section 3.1.1. on organizational culture and climate.

TABLE 4
Construct items for Organizational culture and climate

Item from KEYS	Analogy from Andrioplous (2001)	Derived from	Variable
In this organization there is a lively and active flow of ideas.	Open Communication channel	Angle, 1989; Kanter, 1983; Amabile, 1998; Robinson and Stern, 1997	ORG_CUL_CLI **= .77**
People are encouraged to take risks in this organization.	Risk-taking	Amabile, 1988; Sternberg et al., 1997	
Failure is acceptable in this organization if the effort on the project was good.	Participative Safety	Anderson et al., 1992; Brand, 1998	
People are recognized for creative work in this organization.	Trust and respect of the individual	Hennessy, Amabile & Martinage, 1989	
I have the freedom to decide how I am going to carry out my projects.	Self initiated activity	Bailyn, 1985; King & West, 1985; Ahmed, 1998; Robinson & Stern, 1997	

This method is chosen since constructing organizational culture and climate simply as the mean score of the 3 dimensions from the KEYS instrument elucidated above would yield in high but unreliable reliability values (Cortina, 1993) due to the large number of items (12

items). The new construct has a respectable alpha coefficient of .77. The ORG_CUL_CLI variable is squared and added to the regression of model 2, which is common to address curve linear relationships and multiplied with LEAD_STYLE to test the synergy with leadership style in model 3.

Leadership style

Within leadership style, supervisory encouragement is measured and added to model 1 till 5 as the mean score of 4 likert scale questions on the perceptions of employees on their leader's goal clarity, leader's communication with the work group, work-group support and leader's appreciation to creative contributions. Work group support is constructed and added to model 1 as the mean score of four likert scale questions and expresses the perceptions of employees on the work group commitment, levels of trust and strength of relationships, the composition of the work group in terms of backgrounds, talents and abilities and the degree of supportive criticism to ideas (hypothesis 5). Example of an item in the supervisory encouragement scale is: *My supervisor values individual contributions to projects.* Example of an item in the work-group support scale is: *There is a good blend of skills in my workgroup.* For reasons of consistency, two items within the supervisory encouragement have been reversed. Reliability analysis using Cronbach alpha (α) for the two dimensions within the determinant of leadership style yields the following Cronbach α's: (4) Supervisory Encouragement (α = .65) and (5) Work group support (α = .74) which are again satisfactory alpha values. To address the statement that a confluence of a conducive leadership style and a strong organizational culture and climate increases product/service innovations for Dutch SMEs (hypothesis 6), the variable LEAD_STY is again constructed in concordance with the scales from the literature review of Andriopoulos (2001) as presented in table 5 and widely discussed in 3.1.2. on leadership style. The new construct has a respectable alpha coefficient of .59 and is added to model 3.

Resources and skills

Within resources and skills, the stimulant variable of resources (hypothesis 8) is a mean score of 3 likert scale questions and expresses the perceptions of personnel on the adequacy of budget, time and data/information necessary to unlock the creative potential of employees. Example of an item in the resource scale is: *The budget for my project(s) is*

generally adequate. Again, reliability analysis of the construct using Cronbach alpha (α) for

TABLE 5
Construct items for Leadership style

Item from KEYS	Analogy from Andrioplous (2001)	Derived from	Variable
My supervisor values individual contributions to projects.	Participative	Burns, 1978; Nystrom, 1979; Bass and Avolio, 1995	LEAD_STYLE **= .59**
My supervisor's expectations for my projects are unclear.	Leader's Vision	Oldham & Cummings, 1995; Scott & Bruce, 1994, Locke and Kirckpatrick (1995)	
There is a good blend of skills in my workgroup.	Develop effective groups	Woodman et al., 1993; Amabile and Gryskiewicz, 1989; Amabile, 1998; Pelz, 1965	

the dimension within the determinant of resources and skills gives the following Cronbach α: (6) Resources (α = .44) which is a relatively low alpha value indicating that the items do not actually measure the same phenomenon.

Therefore, the conclusions made on this element are unfortunately not considered as totally reliable. To address the statement of an optimal resources and skills in relation to product innovations (hypothesis 7), the variable RES_SKI (which is the same as the stimulant scale resources from the KEYS framework) is squared and added to the regression in model 2.

Organizational barriers to creativity

To examine the hypotheses concerning the organizational barriers to creativity within the work environment of Dutch SMEs and the proposition that innovative Dutch SMEs are more likely to realize their innovations by scoring lower on these organizational impediments (hypothesis 9), barriers to organizational creativity are addressed by two obstacle scale from

the KEYS instrument (Amabile et al., 1996): organizational impediments and workload pressure. Organizational impediments is measured as the mean score of 5 likert scale questions on the perceptions of employees on the levels of destructive competition, the defense of employee territory, status quo, risk taking and destructive criticism. Workload pressure is assessed by the mean score of 4 likert scale questions on employees total work environment perceptions on time pressure, deadlines and expectations and the overall distractions besides assignments. Example of an item in the obstacle scale of organizational impediments is: *People in this organization are very concerned with protecting their own territory.* Example of an item in the obstacle scale of workload pressures is: *I have too much to do in little time.* Reliability analysis on the two dimensions using Cronbach alpha gives the following values: (7) Organizational impediments ($\alpha = .77$), (8) Workload pressures ($\alpha = .66$) which are satisfactory values for reliability.

All the questions from the KEYS instrument can be found in the Appendix.

4.2.3. Control Variables

In concordance with previous studies as cited below, four control variables have been included in the analyses of this thesis that are expected to impact the probability of innovative performance and levels of organizational creativity: age, size, independency and sector differences and are shortly introduced below.

Age

Age is a continuous variable depicting the years of existence of Dutch SMEs. Age is sometimes also regarded as the stage in the life-cycle of the firm and several authors have examined the influence of age on the innovative performance of SMEs (Audretsch, 1995; Klepper, 1996; Huergo and Jaumandreu, 2002). In addition, age is also regarded to influence the explanatory variables in this thesis. However, these effects are expected to be ambiguous. For example, younger SMEs are regarded as being more flexible, risk-loving, opportunity seeking and exploratory and this may result in a stronger encouragement of ideas in culture and climate and a higher probability of status quo departure. On the other hand, older firms are expected to have more established norms and routines in their culture, lower levels of flexibility and risk-averseness and a well defined communication channel and network. By this reasoning, controlling for age is believed to be relevant since it effects many aspects of

the conducive dimensions to organizational in the culture and climate, leadership style and resources and skills of Dutch SMEs. In addition, controlling for age also incorporates on the ability of SMEs not only to be creative from a static perspective, but also to remain competitive in terms of organizational creativity from a dynamic perspective.

Size

Size is a continuous variable depicting the number of employees within Dutch SMEs. Including size is a common measure in research on the innovative performance of SMEs (e.g., Damanpour, 1991; Majocchi and Zucchella (2003). As with age, the effects of size on innovation are ambiguous. Nevertheless, size is regarded to play an important role in the innovative performance of SMEs (Damanpour, 1992; Becheikh et al., 2006). However, since the scope of this thesis is already on Small and Medium sized enterprises, the magnitude of these ambiguous effects are expected to be small and therefore they will not be elaborated here in detail.

Independency

Independent is a categorical dummy variable taking value 1 if the SME is independent and 0 for a dependent SME. The dummy variable independent is relevant and included as a control variable in this study since independent SMEs are expected to display lower levels of bureaucracy and higher levels of experimentation and autonomy. In addition, being either independent or dependent as an SME is expected to play a vital role in the type of leadership that is preferred as well as the amount of competition and criticism exerted within the work environment of these SMEs.

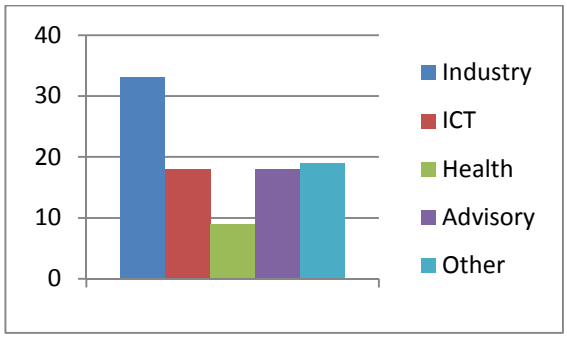
Type of industry

The Dutch SMEs in the dataset operate in a wide variety of industries. Based on the industry codes of the "Centraal Bureau voor de Statistiek" (CBS, 2008)[9], the four largest types of industries were detected in the dataset and clustered in the sector industry, ICT, advisory, research and other specialists and health and medical care, based on similarities of their true type of industry. The remaining industries were combined in the reference category

[9] For more information, refer to Standaard Bedrijfs Instelling 2008 (CBS, 2008).

"others". To control for these industry differences and to further purify the effects of the explanatory variables, categorical dummy variables have been included taking value 1 if the SMEs were operating in the industry and 0 for another industry. The distribution of the five sectors is presented in figure 5. Controlling for type of industry is regarded to be relevant since SMEs in some industries are more obliged to encourage creativity in their culture and daily activities as others (e.g., pharmaceutical and other technology abundant industries that need to adapt to continuous improvements and thrive on change and opportunities). In addition, innovations could be more common, accessible or expensive in one type of industry as compared to another type of industry.

Figure 5: Distribution of the sectors in the sample



Now that all the variables and measurements are explained, the next section will emphasize on the statistical method and models that will be used to test the hypothesis. A summary of the variables will be exposed in the Appendix.

4.3. Statistical Method and Empirical Strategy for Hypothesis testing

The hypotheses from the theoretical framework will be tested using the statistical method logistic regression. The statistical method of logistic regression is most commonly used in studies to depict possible determinants of certain dichotomous outcomes or phenomena. In this study, logistic regression will be used to paint an initial portrait of innovative Dutch SMEs in terms of the KEYS to creativity in organizational culture and climate, leadership style, resources and skills as well as in barriers to organizational creativity.

First of all, logistic regression is chosen, since the dependent variable in this study is represented as a binary one, i.e. a variable that can only take two different outcomes (binary dependent variable will take value one if the Dutch SME is classified as innovative and zero for non or less innovative SMEs), and several categorical and continuous independent variables as mentioned before will be used to predict the innovativeness of Dutch SMEs. For binary dependent variables, estimators of $E\{Yi|Xi\}$ are not bound by 0 and 1, variables of the disturbances are heteroskedastic and the error-term has a non-normal distribution (Gujarati, 2003) and it is therefore inadequate to treat them as continuous variables. In this case, logistic models are more appropriate. Logistic regression models have non-linear distribution of the data, the estimators $E\{Yi|Xi\}$ lie between 0 and 1 and are usually estimated using maximum likelihood technique. Second, the logistic regression method perfectly depicts the relative influences of the separate KEYS to creativity variables on the likelihood of innovation of Dutch SMEs. The logistic regression yields the probability of innovations to occur given the explanatory variables and shows which explanatory variables contribute to this probability. Using Y=0 as a reference category demonstrates to which of the explanatory variables of our interest the innovative SME is more likely to belong to, hence, how to characterize the innovative SMEs in comparison to the non-innovative group in terms the KEYS to creativity in culture and climate, leadership style, resources and skills and barriers to organizational barriers to creativity.

The ordinal logistic regression method would be applicable as well yet we have a too small sample (120) to divide the dependent variable in several categories and still achieve a reliable outcome.

Having selected the binary logistic regression method the statistics programme gives us several different options to run the analysis. The default method is "enter" by which all of the covariates are placed into the regression model in one block, and parameters estimates are

calculated for each block. Other options are the "stepwise methods" yet these are considered to be used when conducting exploratory work and the "enter" method is assumed to be the appropriate method when testing theory (Studenmund and Cassidy, 1987). Since we are testing research questions which are deducted from our theoretical framework the "enter" method is used.

As the regression method is chosen, the next step is to emphasize the empirical strategy. To test the hypotheses from the theoretical framework, the following empirical strategy is conducted. The empirical strategy distinguishes three different models that are explained below.

MODEL 1: KEYS TO CREATIVITY AND INNOVATIVENESS

MODEL 1 deals with the following hypotheses:

H2: *Dutch SMEs possessing higher levels of organizational encouragement in their organizational culture and climate are more likely to be involved in a product innovation.*

H3: *Dutch SMEs possessing higher levels of freedom in their organizational culture and climate are more likely to be involved in a product innovation.*

H4: *Dutch SMEs possessing higher levels of challenge in their organizational culture and climate are more likely to be involved in a product innovation.*

H5: *Dutch SMEs possessing higher levels of supervisory encouragement and work group support in their leadership style are more likely to be involved in a product innovation.*

H8: *Dutch SMEs possessing higher levels of resources in their resources and skills are more likely to be involved in product innovation.*

H9: *Dutch SMEs possessing lower levels of organizational impediments and workload pressures in their barriers to organizational creativity are more likely to be involved in a product innovation.*

The above hypotheses are tested by the following regression equation:

$$\boldsymbol{INNOVATION_i} = \alpha + \beta_1 ORGAN\ ENCOUR + \beta_2 FREEDOM + \beta_3 CHALLENGE + \beta_4 SUPER\ ENCOUR + \beta_5 WORK - GROUP\ SUP + \beta_6 RESOURCES + B_7 ORGAN\ IMPED + \beta_8 WORKL\ PRESS + \beta_9 lnAGE + \beta_{10} lnSIZE + \beta_{11} INDEP + \beta_{12} SECT\_IND + \beta_{13} SECT\_ICT + \beta_{14} SECT\_ADV + \beta_{15} SECT\_HEALTH + \varepsilon$$

For all the above hypotheses the same empirical strategy is followed. To control for possible interrelatedness between the KEYS explanatory variables and their influence on the innovativeness of Dutch SMEs, the above hypotheses are tested by a logistic regression equation which includes all separate variables as well as the control variables. The hypotheses are strongly supported when estimates are positive and significant at $\alpha < 0.01$ and hence contribute strongly to the likelihood of innovation to occur within Dutch SMEs, are supported when estimates are positive and significant at $\alpha < 0.05$ and can be perceived as a more than important scale to increase the likelihood of innovation to occur within Dutch SMEs, and weakly supported when estimates are positive and significant at $\alpha < 0.10$. In addition, the above hypotheses are rejected when the estimates of the variables are significant at $\alpha < 0.10$ yet show a negative sign (negative relationship) or not supported for either positive or negative signs with non-significant estimates.

MODEL 2: U-SHAPE RELATION-SHIPS AND INNOVATIVENESS

MODEL 2 is concerned with the following hypotheses:

H1: *There is a relationship of decreasing returns between an embedded organizational culture and climate and the innovativeness of Dutch SMEs.*

H7: *There is an inverted U-shape relationship between the allocation of resources and skills and product innovations of Dutch SMEs.*

The above mentioned hypotheses are tested by the following regression equation:

$$\boldsymbol{INNOVATION}_i = \alpha + \beta_1 ORG\_CUL\_CLI + \beta_2 RES\_SKILLS + \beta_3 ORG\ CUL\ CLI^2 + \beta_4 RES\ SKILLS^2 + \beta_5 lnAGE + \beta_6 lnSIZE + \beta_7 INDEP + \beta_8 SECT\_IND + \beta_9 SECT\_ICT + \beta_{10} SECT\_ADV + \beta_{11} SECT\_HEALTH + \varepsilon$$

Hypothesis 1 is supported when the estimate of ORG_CUL_CLI is positive and at least significant at $\alpha < 0.10$ (weak support) and the estimate of $ORG\ CUL\ CLI^2$, the squared variable of organizational culture and climate (commonplace to test optimal relationships between variables), is negative and again significant at $\alpha < 0.10$. The same strategy holds for hypothesis 7. It is supported when the estimate of RES_SKILLS is positive and significant at $\alpha < 0.10$ and the estimate of $RES\ SKILLS^2$ is negative and again significant at $\alpha < 0.10$.

Hypotheses 1 and 7 are tested by a separate logistic regression equation to avoid severe multicolinearity problems since the self constructed variables ORG_CUL_CLI and RES_SKILLS are mean scores of the KEYS to creativity scales used in the equation of MODEL 1. Again, all control variables have been added to control for characteristics from the organizational profile

MODEL 3: SYNERGY BETWEEN ORGANIZATIONAL CULTURE AND CLIMATE-LEADERSHIP STYLE AND INNOVATIVENESS

At last, MODEL 3 deals with the following hypothesis:

H6: *The synergy between a strong organizational culture and climate and supportive leadership style increases the likelihood for Dutch SMEs to be innovative.*

Hypothesis 6 is tested by the following regression equation:

$$\boldsymbol{INNOVATION}_i = \alpha + \beta_1 ORG\_CUL\_CLI + \beta_2 LEAD\_STYLE + \beta_3 ORG\ CUL\ CLI^{*} LEAD\_STYLE + \beta_4 lnAGE + \beta_5 lnSIZE + \beta_6 INDEP + \beta_7 SECT\_IND + \beta_8 SECT\_ICT + \beta_9 SECT\_ADV + \beta_{10} SECT\_HEALTH + \varepsilon$$

Since hypothesis 6 proposes a positive influence of the synergy effect between a strong organizational culture and climate and a supportive leadership style and innovation, hypothesis 6 is supported when the interaction term ORG CUL CLI*LEAD_STYLE is positive and significant at $\alpha < 0.10$. In addition, extra attention should be paid to the independent variables of ORG CUL CLI and LEAD_STYLE in the equation and their sign and significance. Again, hypothesis 6 is tested by a separate model to avoid severe multicolinearity problems and all control variables are included to enhance the reliability of the outcomes.

4.4. Results

In this section, the results from the empirical research will be illustrated. First, in the preliminary analysis, several descriptive statistics will be illustrated and an independent sample t-test is constructed to examine the differences between the innovative and non-innovative group in the sample for the explanatory variables from the KEYS framework. The obtained differences from the t-test will be explained further by zooming in on the different items in the questionnaire. Finally, the results of the logistic regression analysis are displayed and shed in light of the hypotheses in this study.

4.4.1. Preliminary analysis

Table 6 shows the mean scores of the two groups in the sample on the stimulant and obstacle scales from the KEYS framework of Amabile et al. (1996) representing the arena's within the work environment of SMEs as both conducive and constructive to levels of organizational creativity. Here, mean scores close to 5 indicate high levels of organizational creativity, close to 1 indicate low levels of organizational creativity. In contrary to the organizational profiles of the innovative and non-innovative group of Dutch SMEs, the scores on the explanatory variables for both groups seem to differ largely, slightly skewed towards the propositions made in the theoretical framework. The independent sample t-test shows significant mean differences between the two groups for all the work environment scales of the KEYS framework except for resources. Innovative and non-innovative Dutch SMEs seem to have access to a comparable budget and enjoy sufficient time and information in their projects. On a five point scale, innovative SMEs score 3,8 for resources against a 3,6 for the non-innovative group.

TABLE 6
Descriptive statistics on KEYS work environment scales

KEYS work environment scales	Innovative SME (n=60) Mean	t-statistic	Non Innovative SME (n=60) Mean
Organizational culture & climate			
Organizational Encouragement	4,2	10,76**	3,0
Freedom	3,8	10,66**	2,7
Challenge	4,3	11,96**	3,1
Leadership style			
Supervisory Encouragement	4,0	9,51**	2,9
Work-group support	4,2	10,71**	3,2
Resources and skills			
Resources	3,8	1,50	3,6
Organizational barriers to creativity			
Organizational impediments	1,9	9,09**	3,1
Workload Pressures	3,0	4,84**	3,6

*T-statistics originate from independent sample t-test . *p<0,05 ; **p<0,01

*Dimensions within the organizational culture & climate, leadership style and resources and skills could be answered on a 1-5 point likert scale. A score close to 0 correspond with a lower possession of that dimension and 5 indicates possessing the dimension entirely. For organizational barriers the opposite holds. Scores closer to 0 represent lower organizational barriers to creativity and 5 indicates higher barriers.

The latter result for the control group is mainly explained by relatively high average scores of 4,1 and 3,6 for the questions on availability of resources for creative work and the adequacy of their budget in general. This result might indicate that having a budget is far from sufficient in the process from idea to commercialization and establishing a work environment in which innovations are able to flourish requires, among others, a balance in the other determinants of organizational creativity (Kanter, 1998; Amabile, 1988). Next to this, innovative SMEs seem to possess high levels of challenge, work group support and organizational encouragement within their work environment (with average mean scores of 4,3, 4,2 and 4,1 respectively). This is mainly explained by extremely high average scores on the questions of encouragement of ideas within the workplace for organizational encouragement (4,6), high average scores for the levels of trust and reciprocity within work groups for the dimension of work group support (4,4) and the high average scores for the degree of challenge that is ignited within a certain task or assignment for challenge (4,5). The above mentioned results seem to posture that, within the work environment of innovative SMEs, these supportive conditions of organizational creativity are structurally embedded within the organizational culture and climate and make up the standard of operations,

determining the way of thinking and acting in a creative way. This corresponds with the mere-exposure effect as referred to by Zajonc (1989). Individuals seem to hold on to certain practices and routines when they are continuously confronted and obliged to deal with and learn about certain norms and values. On the contrary, the control group of SMEs seem to significantly lack in the above mentioned dimensions of the work environment depicting remarkably lower values of 3, 3,1 and 3 respectively, due to lower average scores on the acceptation of failed projects in the nature of creative processes (2,6), the composition of heterogeneous teams (2,6) and the inducement of employees to work at their highest potential for a task or assignment (2,6). The lowest scores for the non-innovative SMEs are found within the dimensions of supervisory encouragement and freedom. (2,9 and 2,6 respectively), mostly explained by a significant lack of freedom and ownership within projects (2,2) and extremely weak communication between supervisors and personnel (2,6). The latter could indicate that leaders within non-innovative SMEs put too much emphasis on control and coordination instead of searching for a departure of the status quo through experimentation and giving employees a sense of ownership in their work (Amabile, 1998). Remarkably, also the innovative group of SMEs is showing the lowest scores for freedom and supervisory encouragement (although average scores are still far above average). For the organizational barriers to creativity within innovative and non-innovative Dutch SMEs, the result show that workload pressures are hard to avoid within every type of work environment with average scores of 3,0 for innovative SMEs and 3,6 for the control group. Also during interviews, respondents mentioned workload pressures to be involved in almost all operations and activities at the workplace. In addition, the work environment of the control group of SMEs depicts a risk-averse management (3,75) and a reluctance to depart from the status quo (3,7) (On this occasion, higher scores correspond to higher barriers to organizational creativity).

Hence, the above mentioned descriptive statistics are slightly skewed towards the statements made in the theoretical framework and this shapes promising expectations for the regression analysis in the following section.

4.4.2. Hypothesis testing

In this section, the hypotheses of this thesis will be rejected, supported or partly substantiated. The outcomes of the logistic regression models as introduced in section 4.3. are presented in table 7. Estimates with *** show a p-value of <0.01 and are marked with red, with ** indicate a p-value of <0.05 and are marked in blue and * a p-value of <0.10 which are marked with green. For a more detailed overview of the regression outcomes, the reader is referred to the appendix. Finally, in this section only those results important for hypotheses testing will be mentioned. An evaluation of the estimated results in table 7 in light of the hypotheses from the theoretical framework yields the following observations.

MODEL 1: KEYS TO CREATIVITY AND INNOVATIVENESS

Hypotheses 2, 3 and 4 postulated that Dutch SMEs possessing higher levels of organizational encouragement, freedom and challenge in their organizational culture and climate were more likely to be involved in a product innovation. The results in model 1 show that organizational encouragement exhibits a large positive effect (b = 3.49) and is significant for $\alpha \leq 0.10$ (p = 0,056) and therefore H2 is supported by the data. Evidence is found for the statement that Dutch SMEs enhancing levels of organizational encouragement are able to flourish their innovativeness. In concordance with hypothesis 3, the dimension of freedom turns out to exhibit a strong significant effect on product innovations of Dutch SMEs (b = 3.94, p = 0.008). On the same line of argument as the dimension of organizational encouragement, the partial effect of challenge on the likelihood of innovation is strong (b = 2.15) and again supported at $\alpha \leq 0.10$ (p = 0.057). From the above, hypothesis 4 is supported by the data. Evidence is found to support the hypothesized positive influence of challenge on the likelihood of Dutch SMEs to be innovative. Hypotheses 5 propositioned that Dutch SMEs possessing higher levels of supervisory encouragement and work group support in their leadership style were more likely to be innovative. Hypothesis 5 is partly substantiated by the data given the positive sign (b = 2.22) and significance at $\alpha \leq 0.05$ (p = 0.037) of supervisory encouragement and no significance for the dimension of work group support. Hence, according to data, the dimension of supervisory encouragement plays a more than prominent role in the process of innovation for the determinant of leadership style. Hypothesis 8, which postulated a positive influence of resources on the probability of a Dutch SME being involved in a product innovation, is rejected by the data. Surprisingly, as shown in model 1, higher

TABLE 7
Results of the Logistic Regression Analysis

Model 1: KEYS to creativity and innovativeness		Model 2: U-shape relationships and innovativeness		Model 3: Synergy Organizational culture and climate-leadership style and innovativeness	
Constant	-25.25 (9.85***)	Constant	-32.71 (22.51)	Constant	-62.08 (20.38***)
KEYS STIMULANT SCALES		**U-SHAPE VARIABLES**		**SYNERGY VARIABLES**	
Organizational culture and climate		ORG_CUL_CLI	-0.58 (12.05)	ORG_CUL_CLI	16.48 (5.57***)
Organizational Encouragement to Creativity	3.49 (1.83*)	RES_SKILLS	13.62 (7.66*)	LEAD_STYLE	12.94 (4.99***)
Freedom	3.94 (1.48***)	ORG_CUL_CLI* ORG_CUL_CLI	1.00 (1.73)	ORG_CUL_CLI*LEAD_ STYLE	-3.24 (1.32**)
Challenge	2.15 (1.13*)	RES_SKILLS* RES_SKILLS	-2.02 (1.047*)	**Organizational Profile**	
Leadership Style		**Organizational Profile**		Age	0.12 (0.39)
Supervisory Encouragement to creativity	2.22 (1.06**)	Age	0.32 (0.38)	Size	-0.06 (0.58)
Work-group support	-0.83 (1.63)	Size	0.05 (0.56)	Independent	-0.52 (1.09)
Resources and skills		Independent	-1.56 (0.90)	Sector Industry	-0.64 (1.37)
Resources	-2.97 (1.37**)	Sector Industry	-0.76 (1.20)	Sector ICT	-1.60 (1.58)
KEYS OBSTACLE SCALES		Sector ICT	-0.50 (1.24)	Sector Advisory	-1.92 (1.50)
Organizational barriers to creativity		Sector Advisory	-1.76 (1.32)	Sector Health	-2.36 (1.94)
Organizational Impediments	-0.37 (0.98)	Sector Health	-1.90 (2.13)	**General Statistics**	
Workload pressure	1.09 (0.78)	**General Statistics**		-2 Log Likelihood	62,268
Organizational Profile		-2 Log Likelihood	66,335	CoxSnell R-square	0,666
Age	0.26 (0.53)	CoxSnell R-square	0,632	Nagelkerke R-square	0,859
Size	-0.33 (0.81)	Nagelkerke R-square	0,843		
Independent	-2.41 (1.66)				
Sector Industry	0.41 (1.92)				
Sector ICT	0.90 (2.12)				
Sector Advisory	-0.52 (2.37)				
Sector Health	-2.47 (1.99)				
General Statistics					
-2 Log Likelihood	28,600				
CoxSnell R-square	0,681				
Nagelkerke R-square	0,910				

NOTE: B-Value without brackets, S.E. between brackets.

$\alpha \leq 0.10$*, $\alpha \leq 0.05$**, $\alpha \leq 0.01$***

levels of resources corresponded with a lower probability of a product innovation within Dutch SMEs (b = -2.97, p = 0.030). Based on both the results from preliminary analysis (no significant mean differences between the innovative and control group of SMEs) as well as the outcomes of model 1c in the appendix (no significant positive/negative influence without controlling for other variables), the exhibited negative significant influence of resources on innovation must be explained by the interdependencies between other determinants. This

remarkable result will be discussed and supported by theory in the next section. Hypothesis 9 on the barriers to organizational creativity is not supported by the data. Hence, higher levels of barriers to organizational creativity do not decrease the likelihood of innovation.

MODEL 2: U-SHAPE RELATIONSHIPS AND INNOVATIVENESS

Hypothesis 1 postulated the occurrence of lock-in effects in an embedded organizational culture and climate in relation with the innovativeness of Dutch SMEs. However, the results in model 2 in table 7 show neither a significant effect for the variable ORG_CUL_CLI nor for the squared variable of ORG_CUL_CLI on the dependent variable, product/service innovative performance. Therefore hypotheses 1 is not supported by the data. Hence, no evidence is found for the decreasing returns of an embedded organizational culture and climate and the innovative performance of Dutch SMEs. Hypothesis 7 proposed an optimal allocation of resources and skills associated with the innovativeness of Dutch SMEs. According to results in table 7, hypothesis 7 is supported (although weakly) by the data given the significant effect at $\alpha \leq 0.10$ of the variable RES_SKILLS (b=13.62, p=0.076) and the significant exhibited negative effect of the variable RES_SKILLS_SQ (b= -2.018, p=0.054). This interesting finding together with the negative effect of resources on the innovativeness of Dutch SME (hypothesis 8) is emphasized in the next section.

MODEL 3: SYNERGY BETWEEN ORGANIZATIONAL CULTURE AND CLIMATE-LEADERSHIP STYLE AND INNOVATIVENESS

Hypothesis 6, which propositioned that a strong organizational culture in combination with a supportive leadership style would yield in higher innovative performance for Dutch SMEs than their separate parts (synergy effects), has led to an interesting outcome. As shown in model 3, both the regular variables of ORG_CUL_CLI and LEAD_STYLE exhibit a strong positive significant effect yet, remarkably, the interaction term shows a significant negative effect. Consequently, hypothesis 6 is rejected by the data and hence, the interaction between organizational culture and climate seems to be decreasing the likelihood of innovation within Dutch SMEs. This interesting result will be discussed in detail in the following section.

The high values for the VIF statistic have been taken for granted in model 2 and 3 since this is inevitable when squaring variables or for interaction terms. To summarize and

conclude this section, table 8 will give an overview of the hypotheses and their respective outcomes.

TABLE 8
Overview of hypotheses testing

Overview of hypotheses testing	
H1. There is a relationship of decreasing returns between an embedded organizational culture and climate and the innovativeness of Dutch SMEs	Not supported
H2. Dutch SMEs possessing higher levels of organizational encouragement to creativity in their organizational culture and climate are more likely to be involved in a product innovation.	Supported
H3. Dutch SMEs possessing higher levels of freedom in their organizational culture and climate are more likely to be involved in a product innovation.	Supported
H4. Dutch SMEs possessing higher levels of challenge in their organizational culture and climate are more likely to be involved in a product innovation.	Supported
H5. Dutch SMEs possessing higher levels of supervisory encouragement and work-group support in their leadership style are more likely to be involved in a product innovation.	Partly Substantiated
H6. The synergy between a strong organizational culture and climate and supportive leadership style increases the likelihood for Dutch SMEs to be involved in a physical end product service innovation.	Rejected
H7. There is an inverted U-shape relationship between the allocation of resources and skills and product innovations of Dutch SMEs.	Supported
H8. Dutch SMEs possessing higher levels of resources in their resources and skills are more likely to be involved in product innovation.	Rejected
H9. Dutch SMEs possessing lower levels of organizational impediments and in their barriers to organizational creativity are more likely to be involved in a product innovation.	Not supported

5. DISCUSSION

The previous section has shed a light on the outcomes of the regression models and the consequences for hypothesis in three different models. In this section, the outcomes of the hypotheses will be discussed using, were possible, theory and logic reasoning.

MODEL 1: KEYS TO CREATIVITY AND INNOVATIVENESS

Model 1 investigated to which of the KEYS to creativity variables the innovative group of SMEs in this study were more likely to belong to. It examined which of the KEYS variables played the most significant role for the innovativeness of Dutch SMEs and tried to answer how the innovative SMEs distinguished themselves from their less innovative counterparts in the Netherlands.

Based on the results of the logistic regression analysis in model 1, the following portrait of the innovative Dutch SMEs could be painted. Innovative SMEs in this study turn out to have found a healthy and supportive organizational culture and climate in which encouragement to creativity, freedom and challenge is facilitated (support for hypothesis 2, 3 and 4). According to theory (e.g., Angle, 1989; Kanter, 1983; Abbey and Dickson, 1983; Hennessy, Amabile & Martinage, 1989), the aforementioned leads to a more seeking attitude towards new ideas, technologies and products, promotes an open communication channel in which new knowledge and ideas are more efficiently diffused, guarantees a work environment free of criticism and fair evaluation and elevate the participation of management in the idea generation process. Also, the innovative SME is substantially aware of the vital role a supportive leadership style plays in the process of creativity and innovation. Although theory states that a supportive leadership style is a function of supervisory encouragement to creativity as well as significant work-group support, innovative SMEs in this study seem to put the most emphasis on the encouragement of their supervisor (partial support for hypothesis 5). A possible explanation for this finding could be that since the focus of this study is mostly on micro firms, work group support exhibited by the leader of the company might be a straightforward part of his supervisory encouragement (the work group is the whole firm). A rather interesting notice in this portrait of the innovative SME can be found in the resources and skills arena. Regression outcomes showed that innovative SMEs turned out to flourish more with a lack of budget and resources for their daily operations (rejection of hypothesis 8). The above result is harder to interpret.

Although the finding that increasing levels of resources and skills leads to a decrease in innovativeness for Dutch SMEs seems to contradict with theory which stated that an efficient allocation of money and time triggers the creative potential of employees through the mechanism of intrinsic motivation, spreads a positive and supportive sign and approves the significant contributions of employees work and effort, scholars have also noticed a clear threshold concerning the returns to innovation and the allocation of resources to employees (Amabile, 1998; Shalley et al., 2002). This result could therefore also be a good indicator for a U-shape relationship between resources and innovation as previously stated in the literature. The discussion concerning hypotheses 8 in model 2 which tested this optimal situation will give more answers to this interesting result. Concerning the barriers to organizational creativity, given the lack of support for hypothesis 9, innovative SMEs didn't seem to distinguish themselves significantly in this area compared to their non or less innovative counterparts. Although the general scores on the KEYS obstacles scales organizational impediments to creativity and workload pressure were significantly different and lower compared to their counterparts, due to the combination of all variables in the regression analysis no significance effect was found for the barriers to organizational creativity. A possible explanation for this finding could be that the lower levels of barriers to organizational creativity have resulted in higher scores for the stimulant factors in organizational culture and climate, leadership style and resources and skills (see the significant influences of these variables).

MODEL 2: U-SHAPE RELATION-SHIPS AND INNOVATIVENESS

Model 2 examined the U-shape relationship between the innovativeness of Dutch SMEs and the arena's of organizational culture and climate and resources and skills. Hypothesis 1 which postulated a relationship of decreasing returns between an embedded organizational culture and climate and innovation was not supported by the empirical results. The question if an embedded organizational culture and climate leads to a hollowing of the SMEs innovative performance thus remains unanswered. This is contradictory to theory (e.g., Kanter, 1998; Barret, 1998), which stated that over time, routines, beliefs and practices as espoused by the organizational culture and climate become standardized and unquestioned standing in the way of learning and development and impeding a 'culture of change and innovation' in which members are encouraged to go beyond the status quo, use new

alternatives and perspective to solve problems and feel free to come up with unusual and fuzzy ideas. The findings also seem to conflict with findings of Carlsson (2004) which noted that organizations may transition to stagnating forms after periods of success. On the same line of argument, the findings are contrary to results of Bjerke (2005) which accentuate that successful companies have the tendency to depart from being innovators to administrators. A possible explanation for this finding could be the continuous pressure that is exhibited on SMEs to remain competitive in their innovative 'game' and adapt and react to external changes in order to survive and claim a share in a continuously evolving market. This thus implies that the assumptions, beliefs, attitudes and atmospheres in the work environment of SMEs as manifested by the organizational culture and climate always need to be in line with an innovative strategy that is questioned and adapted over and over again and hence SMEs might therefore be obliged to guarantee a continuously evolving and conducive organizational culture and climate of change that constantly facilitates learning and development and nurture a constant flow of ideas, risk taking and flexibility. According to Capra (1996), SMEs can only retain their position in the market and be of competitive value if they succeed in constantly expanding the framework of the organization and giving members the opportunity to stay at their creative edge and realize products and service that provide significant value and are perceived as interesting for the market. This reasoning is also supported by Rasulzada (2007) stating that: "due to change, globalization, technological development, foreign competition and so on SMEs cannot survive by imposing orders and creating high levels of structures at the cost of organizational innovation (p. 19). As an extra note, this finding might also imply a lower number of bureaucratic SMEs in the study. According to Landy & Conte (2004), bureaucratic firms base their structure on rigidity and irrational use of rules and procedures and are characterized by work environments in which competition instead of cooperation is rewarded, factors that are known to correlate negatively with innovative performance. All these possible explanations are also backed up by the findings for hypotheses 2,3 and 4 in this study.

As stated previously in the discussion on model 1, the results on hypothesis 8 opened the door for a U-shape relationship between resources and skills and the innovativeness of Dutch SMEs. Based on the regression outcomes there was indeed evidence to support this relationship. There seems to be an optimal point of resources allocation where the highest levels of innovation were obtained. This finding aids to the threshold theory of Amabile

(1998) where an efficient allocation of time and money is proposed in relationship with the creative potential of employees. A possible explanation for this finding could be that the innovative Dutch SMEs in this study are now focusing more on extrinsic stimulants in the form of (too high) money rewards and competitive work environments and operate using extreme tight deadlines instead of continuing to use these resources to stimulate the intrinsic motivation of employees. This evidently impedes a negative effect on the innovative performance of the Dutch SME as backed up by the negative influences of resources on innovation in hypothesis 8.

MODEL 3: SYNERGY BETWEEN ORGANIZATIONAL CULTURE AND CLIMATE-LEADERSHIP STYLE AND INNOVATIVENESS

Model 3 investigated if the joined parts of organizational culture and climate and leadership style exhibited a larger effect on the innovativeness of Dutch SMEs than their separated parts. Hypothesis 6 which postured these positive synergy effects on innovation was rejected by the data. Despite of the significance of the interaction effect, the estimator showed a negative sign. Hence the confluence of organizational culture and climate and leadership styles turned out to impede a negative effect on the probability of innovation within Dutch SMEs. This finding clearly contradicts with the existing literature in which the two are said to complement each other in the strive for innovation. According to Howard (1998), strong organizational cultures and climates impact decisive processes of leadership, decision making, performance, internal development and strategic development within SMEs. And, as said by Elkins and Keller (2003), leadership style is a confluence of vision, support for creativity and innovation, encouragement, autonomy, challenge and recognition. A possible explanation for this finding is hard to come up with since it could be twofold. On the one hand, it might be the effect of the leadership style chosen within Dutch SMEs which focuses more on control and coordination, standing in the way of processes such as autonomy and organizational encouragement to creativity. On the other hand it could be the result of a stifle and bureaucratic organizational culture and climate that stands in the way of change and innovation and in fact impedes and controls the behaviour of leaders. Since earlier results of the regression analysis seem to point in the opposite direction of the aforementioned, the answer for this result stays open and mysterious.

6. CONCLUSION

The starting point for this study is the importance of innovation for the wealth of individuals, firms and nations and the acknowledgement of organizational creativity as a significant organizational resource in today's dynamic and uncertain business environment. The locus of innovative activity in this paper are SMEs which is sustained by the shift from the managed to the entrepreneurial economy with SMEs being the engine of growth. Although more and more research is focused on the innovative performance of SMEs and the means by which they do so, many questions are yet unresolved. This thesis hopes to aid to the complex puzzle that is going on for decades concerning the question why some firms are more innovative than others by intensively investigating on the concept of organizational creativity and its relationship with product innovations of Dutch SMEs. Organizational creativity is known to foster organizational processes such as change, effectiveness and survival and is concerned with the creation of complex social systems (work environments) in which individuals are able to flourish their creative potential and work together to accomplish numerous valuable, useful and new products, ideas, procedures, services or processes. Following previous research, this thesis has used the KEYS framework of Amabile et al. (1996) to measure organizational creativity in form of the total work environment perceptions of employees on the levels of creativity. By painting an initial portrait of the innovative SME in terms of the KEYS to creativity, in comparison to their non or less innovative counterparts, this research hopes to give answers to the following central research question:

Research Question: *"Which keys to creativity in organizational culture and climate, leadership style, resources and skills and organizational barriers to creativity determine the innovativeness of SMEs in the Netherlands"?*

This research was an extension of the International Scientific Research Project 2010 (Eureos) and was carried out together with fellow student S. Maarseveen. The two theses differentiate from one another by their specific contributions to the literature as S. Maarseveen empirically explores the confluences of organizational creativity, knowledge appropriation and entrepreneurial capital and their effect on the innovative capacity of Dutch SMEs and this thesis intensively investigates on the complex concept of organizational creativity and its relationship with innovation. The study was conducted within 120 Dutch

SMEs out of which 60 SMEs are or have been involved in a product innovation over the last two years and 60 SMEs function as a none or less innovative control group. To my best knowledge, no research of this kind has been conducted in the Netherlands before and the concept of organizational creativity as well as the relationship between organizational creativity and innovation is a relatively new area within SMEs. In addition, the data for this study can be regarded as original since innovative activities within SMEs are most of the time analyzed within technology abundant industries and this research is focusing on a wide variety of industries ranging from the food and non-food branch to consultancy industries.

This thesis has proposed a conceptual framework in which is hypothesized that the innovativeness of Dutch SMEs is determined by facilitating levels of organizational creativity in their work environment and hence examines an even closer connection between organizational creativity and innovative performance than previously stated. The conceptual framework focuses on three organizational arena's of Dutch SMEs emphasized by Andriopolous (2001) as determinants of organizational creativity: organizational culture and climate, leadership style and resources and skills and also takes into account the largely unexplored barriers to organizational creativity (e.g., Kimberly and Evanisko, 1981; Kimberly, 1981). Within these domains in the work environment several dimensions have been examined as conducive or destructive to levels of organizational creativity and these dimensions have been linked to the well-known conceptual model of Amabile et al. (1996) and hypothesized to facilitate innovativeness within Dutch SMEs making up the conceptual framework in this thesis. The conceptual framework builds further on new perspectives of authors in which the levels of employee creativity and group creativity are largely influenced by social and contextual factors (Turnipseed, 1998; Kanter, 1998; Oldham and Cummings, 1996; Ford, 1996) and investigates on organizational factors since they are known to have the largest effect on innovation (Damanpour, 1991). In addition, the conceptual framework also takes into account that the operations within different arena's of organization might be interconnected, interrelated and beneficial to innovative processes by proposing a synergy effect between organizational culture and climate and leadership style. The hypotheses of the conceptual framework have been examined by using a logistic regression approach. The method of logistic regression is a tool to indicate which variables have the largest influence on the probability of a certain dichotomous outcome (only two outcomes). In this study, logistic regression was therefore a suited method to give answers to the research question

which keys to creativity in organizational culture and climate, leadership style, resources and skills and barriers to creativity exhibited the largest influence on the innovativeness of Dutch SMEs.

According to descriptive statistics, the innovative and non-innovative SMEs in this study show almost overlapping organizational profiles somewhat "downplaying" their influences on levels of organizational creativity and the corresponding innovative outcomes. For the KEYS to creativity, the results are more drastic and noticeable and in this area the innovative SMEs are clearly differentiating themselves from their less innovative counterparts. Except from the stimulant scale of resources, the innovative SMEs show higher average scores on Freedom, Challenge, Organizational encouragement, Supervisory Encouragement and work group support as well as significantly lower average scores on the barriers to organizational creativity. Based on this, innovative SMEs seem to have acknowledged organizational creativity as an important and straightforward element of their day-to-day operations. Every member of the innovative SME seems to be encouraged by the organizational culture and climate as well as supported by his leader. In addition, employees seem to be challenged in their tasks, inspired to use risks and allowed to operate autonomously to a certain point. Interestingly, employees within innovative SMEs produce innovative outcomes utilizing the same budgetary conditions as employees within non-innovative SMEs pointing out that creativity comes from the mind and is expressed by novel and original ideas and is not always reliant on external resources.

The logistic regression models have indicated that the innovative Dutch SMEs are distinguishing themselves by their organizational encouragement to creativity, freedom and challenge in the arena of organizational culture and climate and supervisory encouragement as an important facet of their leadership style. Remarkably, the logit estimates further show that higher levels of resources lead to a lower probability of innovation to occur within Dutch SMEs. This result is also consolidated by the support for a optimal allocation of resources and skills in relationship to the innovativeness of Dutch SMEs. Combining these two results seems to indicate that the innovative SMEs in this study operate at the downward sloping side of the U-shaped curve where resources exhibit decreasing returns to the innovativeness of Dutch SMEs. Finally, an interesting and twofold finding of this thesis is the negative effect impeded by the confluence of organizational culture and climate and leadership style on innovativeness of Dutch SMEs.

To conclude, based on the results of this thesis, why are some Dutch SMEs more innovative than others and which KEYS to creativity could be considered as the driving force behind the innovativeness of Dutch SMEs? This thesis has shown that organizational creativity definitely plays a major role in the strive for innovation and distinguishes the innovative SME from the non-innovative Dutch SMEs in this study. The KEYS to creativity that could be considered as antecedents of innovative activity in the Netherlands are Freedom, Challenge and Organizational Encouragement to creativity as well as Supervisory Encouragement to creativity. In addition, at this point in time, innovative outcomes within Dutch SMEs are flourished in work environments with lower budgets and other type of resources.

6.1. Limitations

This thesis has tried to give an answer to the question why some Dutch SMEs are more innovative than others by intensively investigating on the concept of organizational creativity and its relationship with product innovations of Dutch SMEs. Although this thesis has showed that the innovative SMEs are clearly differentiating themselves from their less innovative counterparts in terms of their levels of organizational creativity, the author is aware that other external variables could have influenced the innovative capacity as well as the final effect of organizational creativity on innovation and therefore this in the first place must be considered as a limitation of this thesis but also an opportunity for future research. Incorporating on all these variables extensively was simply out of the scope of this thesis and would have been too time consuming. For future research, the author recommends to use this thesis as a building block and start examining the relationship with other explaining variables and finally focus on interactions. Also, the author has put a lot of effort in conceptualizing three different arena's within the work environment (organizational culture and climate, leadership style and resources and skills) and has tried to measure the determinants of organizational culture and climate and leadership style by questions originating from the tested KEYS framework. However, this must be considered as a limitation since this has never been executed before in this manner or proven by earlier research. For future research, the author therefore suggests to measure the concepts of organizational culture and climate and leadership style with accepted frameworks.

6.2. Future research

This thesis clearly yields numerous possibilities for future research. As mentioned earlier, an interesting possibility for future research is to perform an ordinal regression to distinguish between different types of innovation. Furthermore, future research could focus more on the robustness of the outcomes in this thesis to further specify the KEYS to creativity that yield into (different types of) innovation and extend the KEYS framework (Amabile et al. 1996). In addition, the sample size could be increased to make the outcomes more reliable and representative. Also, to gain more insight in the operations within the work environment of Dutch SMEs qualitative studies could be executed. To check for country differences, the same study could be executed in different countries over the world and the results could be compared to those within the Netherlands. In addition, one innovative/non-innovative SME within the Netherlands could be compared to an innovative/non-innovative SME in another country across the world and issues such as national governance and environmental support could be introduced. To check for size differences, the same study could be extended to larger firms for both the Netherlands as well as countries all over the world. Also, this study could be conducted within specific sectors.

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Appendix A.

Table A-1: The questions used in the KEYS scales (Amabile et al., 1996 b)

Dimension	Question
Organization encouragement	In this organization there is a lively and active flow of ideas.
	New ideas are encouraged in this organization.
	Performance evaluation in this organization is fair.
	People are recognized for creative work in this organization.
	Failure is acceptable in this organization if the effort on the project was good.
	People are encouraged to take risks in this organization.
Supervisory encouragement	My supervisor's expectations for my projects are unclear.
	My supervisor supports my workgroup within the organization.
	My supervisor does not communicate well with our workgroup.
	My supervisor values individual contributions to projects.
Workgroup Support	There is a feeling of trust among the people I work with most closely.
	Within my workgroup we challenge each other's ideas in a constructive way.
	There is a good blend of skills in my workgroup.
	The people in my workgroup are committed to our work.
Resources	Generally I can get the resources I need for my work.
	The budget for my project(s) is generally adequate.
	I can get all the data I need to carry out my projects successfully.
Challenge	I feel that I am working on important projects.
	The tasks in my work are challenging.
	The tasks in my work call out the best in me.
Freedom	I have the freedom to decide how I am going to carry out my projects.
	I do not have the freedom to decide what projects I am going to do.
	In my daily work environment I feel a sense of control over my own work and own ideas.
Organizational impediments	There is much emphasis in this organization on doing things the way we have always done them.
	People in this organization are very concerned about protecting their territory.
	There is destructive competition within this organization.
	Top management does not want to take risks in this organization.
	Destructive criticism is a problem in the organization.
Workload pressure	I have too much to do in too little time.
	There are too many distractions from project work in this organization.
	There are unrealistic expectations for what people can achieve in this organization.
	I feel a sense of time pressure in my work.

Appendix B.

Regression Results Model 1: KEYS to creativity and innovativeness

	Model A	Model B	Model C	Model D	Model 1
Constant	-22.74 (5.32***)	-11.92 (2,38***)	-1.09 (1,45)	5.78 (1.89***)	-28.28 (9.83***)
Organizational Profile					
Age	0.79 (0.38)	-0.11 (0.27)	-0.85 (0.18)	0.20 (0.25)	0.26 (0.53)
Size	0.124 (0.57)	-0.23 (0.36)	0.07 (0.24)	0.25 (0.35)	-0.33 (0.81)
Independent	-0.95 (1.06)	-0.25 (0.65)	-0.32 (0.47)	-0.49 (0.60)	-2.41 (1.66)
Sector_Industry	-0.66 (1.30)	0.96 (0.83)	1.54 (0.58***)	0.99 (0.73)	0.41 (1.92)
Sector_ICT	-0.44 (1,45)	0.58 (0.93)	0.82 (0.64)	0.57 (0.81)	0.90 (2.12)
Sector_Advisory	-1.34 (1.52)	0.09 (0,96)	0.40 (0.63)	0.06 (0.79)	-0.52 (2.37)
Sector_Health	-0.97 (1.66)	-0.66 (1.32)	0.11 (0.82)	-0.59 (1.12)	-2.47 (1.99)
Organizational culture and climate					
Organizational encouragement to creativity	2.298 (0.96**)				3.49 (1.83*)
Freedom	2.73 (0.93***)				3.94 (1.48***)
Challenge	1.66 (0.60***)				2.15 (1.13*)
Leadership Style					
Supervisory Encouragement to		1.60 (0.53***)			2.22 (1.06**)

creativity				
Work-group support	1.90			-0.83
	(0.52***)			(1.63)
Resources and skills				
Resources		0.16		-2.97
		(0.29)		(1.37**)
Organizational barriers to creativity				
Organizational impediments			-2.13	-0.37
			(0.43***)	(0.98)
Workload pressures			-0.44	1.09
			(0.39)	(0.78)

NOTE: B-Value without brackets, S.E. between brackets. $\alpha \leq 0.10$, $\alpha \leq 0.05$**, $\alpha \leq 0.01$****