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# Determinants and dimensions of firm growth

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**Abstract:** *Firm growth is an important indicator of a thriving economy. Although the determinants of firm growth have been studied in various disciplines, an integrated analysis is still lacking. This paper attempts to provide such an analysis. Many determinants of firm growth are summarized and classified into three dimensions: individual, organizational, and environmental determinants. By conducting an empirical study using 523 Dutch small and medium sized firms, we identify the determinants of firm growth which is measured by employment growth. Our findings show that environmental determinants do not affect firm growth. Individual ones do: entrepreneurs with growth motivation and having technical knowledge are more likely to grow their firms while entrepreneurs characterized by a strong need of achievement are less likely to engage in firm growth. Organizational determinants have the most influence on firm growth: the older the firm, the less likely it is to grow. Availability of financial capital is found to be crucial to firm growth. Finally, the firm's scalability (its preparedness to grow) is found to have a positive impact on firm growth.*

**Keywords:** SMEs; firm growth; integrated analysis; individual determinants; organizational determinants; environmental determinants; conceptual approach; statistical approach

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# 1. INTRODUCTION

Small and medium sized enterprises (SMEs) are an important job generator (Carree & Klomp, 1996). Hence, insight into the determinants of firm growth is important from a policy perspective. Over the last two decades, these determinants have been studied in various disciplines, such as economics, strategy, psychology, network theory and innovation. Nevertheless, it is observed that knowledge of firm growth is still limited (Davidsson & Wiklund, 2000; Wiklund, Patzelt & Shepherd, 2007). The existing literature is highly fragmented. For instance, research from a psychological perspective focuses on the behaviour of the entrepreneur (Begley & Boyd, 1987); research from a strategy point of view concentrates on the relationship between environment, business strategy and growth (McDougall, Robinson & DeNisi, 1992); while research on economics focuses on the relation between growth and firm size (Audretsch, Klomp, Santarelli & Thurik, 2004). Thus, there exist diverse views, with none of them explaining the determinants of firm growth in a holistic manner.

Growth is an organizational outcome resulting from the combination of firm-specific resources, capabilities and routines (Nelson & Winter, 1982). A firm's growth opportunities are highly related to its current organizational production activities (Coad, 2009). Path-dependency is thus an important theme of firm growth (Coad, 2009). Firm growth is also uncertain: environmental conditions such as competition and market dynamics play their roles. For small firms, growth is also influenced by personal ambition of an entrepreneur. For instance, not every entrepreneur aims to grow her business. Mosselman, Frederiks and Meijaard (2002) observed that only 16% of the small business owners in the Netherlands aim to grow. Although recent studies attempt to link determinants from different perspectives or dimensions (Baum, Locke & Smith, 2001; Covin & Slevin, 1997; Lumpkin & Dess, 1996), their explanatory power is low due to the relatively small number of variables (Davidsson, Delmar, & Wiklund, 2006). It is therefore of special interest to examine the determinants of firm growth in an integrated way, and to identify the most important determinants of firm growth. Thus, in this study, we classify the determinants of firm growth into three dimensions: individual, organizational and environmental determinants (Baum et al., 2001).

The present paper attempts to provide an integrated analysis on the determinants of firm growth. A new data survey on firm growth, conducted by EIM Business Policy and Research, provides information on a wide range of explanatory variables. It gives an opportunity to investigate the determinants of firm growth in a comprehensive way. We attempt to identify the most important determinants from a wide range of perspectives within the framework of a simple model using a data set comprising 523 Dutch SMEs. The model is simple in the sense that moderation and mediation effects will not be taken into account. Also, firm growth will only be measured as employment growth. Finally, the cross-sectional nature of the data does not allow for an analysis of dynamic aspects.

This paper is structured as follows. In section 2, we review the literature on the determinants of firm growth in the sequence of individual, organizational and environmental dimensions. In section 3, we describe the research methodology regarding sampling, variables and model testing. We present the results of empirical analysis in section 4. In section 5, we discuss the key findings and implications for future research.

## 2. LITERATURE REVIEW

As already described in the introduction, we attempt to study firm growth in an integrated way rather than biasing any particular perspective. In order to summarize the determinants from a wide range of perspectives, we classify these determinants into three dimensions, namely, individual determinants, organizational determinants and environmental determinants. In addition, we also

include ‘negative’ determinants, titled as growth barriers. These determinants are discussed in sections 2.1, 2.2, 2.3 and 2.4, respectively.

## **2.1. Individual Determinants**

The growth of a firm is to a certain extent a matter of decisions made by an individual entrepreneur. Previous studies indicate that an entrepreneur’s personality traits, growth motivation, individual competencies and personal background are the most important determinants that determine the growth of a firm (Baum et al., 2001; Delmar, 1996; Shane, Locke & Collins, 2003). These determinants are detailed in the following sub-sections.

### **2.1.1. Personality traits**

The Big Five model (Barrick & Mount, 1991; Hurtz & Donovan, 2000; Johnson, 1990) is often used and identified as a robust indicator of an individual’s personality. The Big Five factors – Extraversion, Emotional stability, Agreeableness, Conscientiousness and Openness to experience – are generally agreed among some personality theorists as representative personality traits or characteristics (Judge, Higgins, Thoresen & Barrick, 1999; Mount & Barrick, 1998). It has been argued that the Big Five factors also represent the potential personality traits of entrepreneurs (Nicholson, 1998). Based on the Big Five model, entrepreneurial personality traits have been further classified and the following characteristics are widely recognized by earlier quantitative and qualitative research:

**Need for achievement:** McClelland argues that individuals with a high degree of need for achievement to engage in activities or tasks are more likely to take greater responsibility for outcomes than those who have a low degree of need for achievement (McClelland, 1965). Based on a review of 23 studies, Johnson (1990) concludes that there is a positive relationship between need for achievement and entrepreneurial activity. A recent study also confirms the important role of need for achievement in explaining entrepreneurial activity (Collins, Locke & Hanges, 2000). Lau and Busenitz (2001) found a strong positive relationship between the need for achievement and the ambition to grow the firm. Hence, we can imply that there might be a positive relationship between need for achievement and firm growth.

**Risk taking propensity:** Risk taking propensity seems to be an important trait of an entrepreneur. An entrepreneur can be characterized as someone who seeks opportunities, faces uncertainties and takes risks (Venkataraman, 1997). It has been indicated that owners of young and established firms who are not risk averse are more likely to be ambitious to grow the firm (Bager & Schøtt, 2004). Similar evidence has also been found at the individual level by Casser (2007). Individuals with a high degree of risk taking propensity do not fear to take action for growing their business further. However, most of the empirical studies have not shown any significant role of risk taking propensity in entrepreneurial activities (Babb & Babb, 1992; Kogan & Wallach, 1964; Litzinger, 1961; Low & Macmillan, 1988; Palich & Bagby, 1995). The reason behind such a weak relation might be that entrepreneurs have different perceptions of risks (Corman, Perles & Vancini, 1988; Fry, 1993; Sarasvathy, Simon & Lave, 1998). Entrepreneurs also encounter various types of risks. Some of these risks might have direct effect on their behaviour, while some might not. Nevertheless, based on the relationship between risk taking propensity and growth ambition, we propose a positive impact of risk taking propensity on firm growth.

**Locus of control:** Locus of control is the belief of an individual to what extent their actions or personal characteristics affect outcomes. Individuals with an *external locus of control* believe that the outcome of an event is out of their control (Shane et al., 2003). Individuals with such beliefs are less likely to grow their firms. Entrepreneurs are generally considered to have an *internal locus of control*. They believe that their actions and decisive behaviour affect the outcome of an event (Rotter, 1966). In the entrepreneurship literature, *internal locus of control* is regarded as one of the motivations to start and develop one’s own business. Individuals with an *internal locus of control* are more likely to seek entrepreneurial roles in order to let their action have a direct impact on the results (Rotter, 1966).

**Self-efficacy:** Self-efficacy is defined as an individual's ability to gather and implement the necessary personal resources, skills and competencies in order to achieve a given task (Bandura, 1997). Self-efficacy has proved to be a robust predictor of an individual's performance for a specific task (Shane et al., 2003). Growth is an important indicator of individual performance, specifically if the individual is an owner of a small business. One can argue that an individual with high self-efficacy for a given task will put more effort and time into it, make better plans and strategies, self-evaluate and modify goals if necessary to successfully accomplish the task. This type of individual is open to suggestion and feedback and takes a positive attitude while facing negative situation (Shane et al., 2003). He/she knows how to continuously improve based on feedback and previous experience.

Furthermore, the following attributes of self-efficacy, such as goal orientation and openness, are considered important. It is well known that higher goals often lead to better performance results than moderate or low goals (Locke & Latham, 1990). Openness can be interpreted as being intellectual, intelligent, and open to new ideas and experience. Bird (1989) claims that creativity and ability to discover innovative ways are key factors in the venture success. In today's competitive business world, entrepreneurs have to remain receptive to competing new products and technology in the changing markets in order to sustain the competitive position to survive and grow. The dynamic environment requires intelligence and curiosity to seek and acquire new knowledge and it needs innovative thinking to develop new strategies to take advantages of opportunities provided by the constant change. Baum (1994), in his empirical analysis on the architectural woodworking industry, found among all used variables, that self-efficacy has a strong positive relationship with realized growth. We can therefore argue that self-efficacy might be a predictor of growth.

**Extraversion:** Extraversion is primarily associated with the quantity and intensity of building and maintaining relationship, and requires active engagement with high energy levels, positive emotion and excitement (DeNeve & Cooper, 1998). Extraversion has been used originally as an indicator of job performance for managers and sales people (Barrick & Mount, 1991; Vinchur, Schippmann, Switzer & Roth, 1998). It is also applicable to entrepreneurs since they play a crucial role in both management and profit-oriented practices in order to survive and grow (Ciavarella, Buchholtz, Riordan, Gatewood & Stokes, 2004). Morrison, Breen and Ali (2003) observed that extraversion is strongly related to the performance of franchisees. Furthermore, sociability is an important component of extraversion. Entrepreneurs with strong sociability are more likely to engage in developing social networks, ultimately resulting in stronger relationships with suppliers, customers and partners (Barringer & Greening, 1998). Baron and Markman (2000) argue that the ability to establish and develop networks with suppliers, advisors and customers is crucial for effectively increasing the likelihood of venture success and consequently the growth of venture. We can thus suggest a positive relationship between extraversion/sociability and firm growth.

### **2.1.2. Growth motivation**

As discussed above, personality traits of entrepreneurs are important but they may not necessarily result in the actual growth of a firm. It has been argued that personality traits contribute more to the *growth motivation* (Delmar, 1996). Intrinsic motivation plays a rather important role in an entrepreneur's behaviour which in turn contributes to the actual growth (Delmar, 1996). Intrinsic motivation implies that growth is highly determined by personal values and interests of the entrepreneur. Personal values can be defined as a generalized and organized conception of an entrepreneur, which influence the behaviour and motivation of entrepreneurs and are determined by personality traits. Delmar (1996) argues that an entrepreneur who has greater intrinsic motivation, who experienced growth before or who is more innovative, is more likely to be ambitious towards firm growth and is more likely to engage into further growth. Often a firm starts very small and grows to a certain size to become economic viable. Once the firm reaches a minimum efficient scale, the entrepreneur has the freedom to decide whether he wants the business to grow or not. Not every entrepreneur aims to have his/her business grow further. For instance, Glancey (1998) shows that entrepreneurs primarily motivated by 'being your own boss' are less likely to pursue growth. The ration-

ale behind this is that they do not want to delegate key functions which lead to a loss of control in decision making. Only 16% of the small business owners in the Netherlands were found to have motivation to grow (Mosselman et al., 2002). Several studies across various countries (Cliff, 1998; Delmar & Davidsson, 1999; Dennis & Solomon, 2001; Human & Matthews, 2004) also demonstrate that most business founders have modest growth aspirations, which in turn has a direct effect on firm growth. Therefore, incorporating the intrinsic growth motivation of an entrepreneur is crucial in determining firm growth.

### **2.1.3. Individual competencies**

Individual competencies can be defined as the knowledge, skills and/or abilities required to perform a specific job. It can be categorized into general individual and organizational competencies, and specific competencies (Boyatzis, 1982). Chandler and Jansen (1992) combine the general individual and organizational competencies – referring to them as organizational skills – with opportunity recognition skills and name them as managerial skills. Specific competencies include for example technical and industrial skills. Having conducted an empirical research on US architectural woodwork firms, Baum et al. (2001) found that specific competencies have a highly significant direct impact on a firm's growth.

### **2.1.4. Personal background**

Personal background includes general information on an individual such as gender, age, education and experience. Various studies have been conducted on this aspect. Welter (2001) found a significant difference between the ambition to grow among male and female entrepreneurs. The result indicates that male entrepreneurs have higher growth ambitions when compared to female entrepreneurs (Welter, 2001). This may be due to the constraints in time, experience and resources available to female entrepreneurs (Cliff, 1998). However, the effect of gender is still ambiguous. Some studies show that female entrepreneurs do not underperform in growing their business regarding profit and employment (DuRietz & Henreksson, 2000) while others do find that female owned business grow less (Cooper, Gimeno-Gascon & Woo, 1994; Fischer, Reuber & Dyke, 1993).

Age is often used as a factor that influences the growth ambition and therefore several studies investigate the influence of age. The results of these studies all indicate a significantly negative relation between age and growth ambition (Autere & Autio, 2000; Welter, 2001). Scholars argue that this negative relationship may be due to the entrepreneur's initial goal of growth, or due to a higher energy level and willingness of younger entrepreneurs to test their abilities as compared to older entrepreneurs (Davidsson, 1991; Sapienza & Grimm, 1997; Welter, 2001). Therefore, we could argue that male entrepreneurs are more likely to engage in actual growth when compared to female entrepreneurs, and that the older the entrepreneur, the less likely he/she is to grow the firm.

Earlier researches show that an entrepreneur's experience with industry and any prior entrepreneurial experience have a positive impact on firm performance. Orser, Hogarth-Scott and Wright (1998) found a positive relationship between entrepreneurs with related industry experience and their willingness to engage in growth activities. They argue that related experience builds up a high degree of self-confidence among entrepreneurs (Orser et al., 1998). Delmar and Shane (2006) found that founders' entrepreneurial experience and experience with related industry does matter to venture success. Previous entrepreneurial experience provides tacit knowledge of organizational routines and skills by which they know how to find required resources and how these resources can be appropriately utilized for current business (Delmar & Shane, 2006; Ripsas, 1998; Shepherd, Douglas, & Shanley, 2000). Entrepreneurs with prior entrepreneurial experience have much clearer ideas of necessary roles and responsibilities in organizations (Ericsson & Smith, 1991). By learning from previous mistakes, experienced entrepreneurs can be more effective in managing the new venture (Ripsas, 1998; Shepherd et al., 2000). In addition, experienced entrepreneurs have already established a network of employees, suppliers, investors and customers during their previous business (Campbell, 1992). This network plays a crucial role for the success of a new venture. Growth can be used as an indicator for measuring venture success. Therefore, the aforementioned arguments suggest that entrepreneurial experience has a positive impact on firm growth.

Industrial specific knowledge such as production processes, market niches, or technology is also tacit and only available through industry participation (Johnson, 1986). Entrepreneurs with industry experience will have a better understanding of the industrial environment, such as customer characteristics of the market that the new venture engage in. The social network within the industry may help them to obtain first important commitment from suppliers and customers, which is very crucial for the success of a new venture. Research shows that entrepreneurs with industry experience are more likely to survive and to develop their businesses compared to inexperienced ones (Cooper et al., 1994; Klepper, 2001). Hence, we can conclude that industry experience has a positive influence on firm growth.

It is observed that high education level has a positive impact on firm performance in terms of growth (Sapienza & Grimm, 1997; Storey, 1994). However, the relationship between high education and growth remains ambiguous. While Kolvereid (1992) shows that entrepreneurs with high education are more likely to have their business grow, both Nandram and Samsom (2002), and Welter (2001) demonstrate a negative relationship between education level and the ambition to grow. Though an entrepreneur with more knowledge is able to make good use of opportunity and resource, more knowledge can also make him/her slow in decision making. An empirical study based on a large longitudinal data set indicates that education and experience affect growth only when accompanied by growth motivation (Wiklund & Shepherd, 2003). We argue that although highly educated entrepreneurs might be slow in decision making, they are able to make rational decisions which leads to actual firm growth.

## **2.2. Organizational Determinants**

Firm growth is an increase in certain attributes, such as sales, employment, and/or profit of a firm between two points in time (Hakkert & Kemp, 2006). Firm growth can be determined by the degree of effectiveness and capability with which firm-specific resources such as labour, capital and knowledge are acquired, organized, and transformed into sellable products and services through organizational routines, practices, and structure (Nelson and Winter, 1982; Nickell, 1996; Nickell, Nicolitsas, & Dryden, 1997). Thus, organizational determinants should have more direct impacts on firm growth. Various empirical studies have been conducted to explore the determinants of growth with respect to this dimension. In summary, the following determinants have been frequently discussed in previous studies from various disciplines: *firm attributes, firm strategies such as market orientation and entrepreneurial orientation, firm specific resources including human capital and financial resources, organizational structure and dynamic capability*. These determinants are discussed in the following sub-sections.

### **2.2.1. Firm attributes**

The classical firm attributes refer to firm age and size. The discussion on the relationship between firm age/size and firm growth has its origin in Gibrat's law (Audretsch et al., 2004), which states that the growth rate of a firm is independent of its initial size and that there is no difference between firms in the probability of a given growth rate during a specific time interval within the same industry. However, empirical studies do not find supporting evidence (Becchetti & Trovato, 2002). Several studies show that younger firms show higher growth rates than firms that exist for many years. The negative effect of age on firm growth is consistent even among various countries and industries (Geroski & Gugler, 2004; Glancey, 1998; Liu, Tsou & Hammitt, 1999; Reichstein & Dahl, 2004; Robson & Bennett, 2000; Yasuda, 2005).

The stylized fact of firm size has been found in the industrial economic literature. Small firms grow relatively fast since they have to achieve a minimum efficient size (Audretsch et al., 2004). Similarly, Yasuda (2005) finds a negative effect of firm size on firm growth in the case of Japanese manufacturing firms. Other studies which incorporated different countries and industries also indicate a negative effect of size on firm growth (Almus & Nerlinger, 2000; Bottazzi & Secchi, 2003; Calvo, 2006; Dunne & Hughes, 1994; Goddard, Wilson & Blandon, 2002; McPherson, 1996). Furthermore, researchers who studied firm growth in different size groups suggest that Gibrat's law of



size independence only holds for firms above a certain size threshold, for instance a relatively large size with over 400 employees (Bigsten & Gebreeyesus, 2007). Therefore, we can conclude that there exists a negative relationship between firm size and growth especially for firms with less than 400 employees.

### **2.2.2. Firm strategies**

Firm growth can be determined by how successfully one sells products and services to the customers. Therefore, *market orientation* can be considered an important determinant of growth. Firms with *market orientation* are able to track and respond to the customer's needs and preferences. They are more likely to develop their market intelligence as well as have the ability to coordinate internal processes in order to respond quickly and effectively to customers and external stakeholders. Consequently, *market orientation* enables better satisfaction of customers and stakeholders which in turn result in a firm's growth (Hult, Snow & Kandemir, 2003; Narver & Slater, 1990). There are several ways of defining *market orientation*. *One*, Jaworski and Kohli (1990) identify three sets of activities, namely intelligence generation, intelligence dissemination, and responsiveness to describe *market orientation*. *Two*, a framework focused on organizational culture defines *market orientation* on dimensions of customer orientation, competitor orientation and inter-functional coordination (Narver & Slater, 1990). Nevertheless, regardless of the various definitions of *market orientation*, empirical study does show that *market orientation* is significantly related to the overall performance of a firm (Jaworski & Kohli, 1993).

*Entrepreneurial orientation* is defined as *innovation*, *proactiveness* and *risk taking* on the firm level (Miller, 1983). The concept is further developed into five dimensions with the additional dimensions of *autonomy* and *competitive aggressiveness* (Lumpkin & Dess, 1996, 2001). *Autonomy* is defined as independent action by an individual or a team aimed at bringing forth a business concept or vision and carrying it through to completion. *Innovativeness* refers to a willingness to support creativity and experimentation in introducing new products/services and novelty, technological leadership, and R&D in developing new processes. *Risk taking* means a tendency to take bold actions such as venturing into unknown new markets, committing a large portion of resources to ventures with uncertain outcomes and/or borrowing heavily to invest in business. *Proactiveness* is an opportunity-seeking, forward-looking perspective involving introducing new products or services ahead of the competition and acting in anticipation of future demand to create change and shape the environment. *Competitive aggressiveness* reflects the intensity of a firm's efforts to outperform industry rivals, characterized by a combative posture and a forceful response to competitor's actions.

It is believed that entrepreneurial-oriented firms will remain ahead of competition by introducing new products/services to the market, which in turn brings competitive advantage and may lead to significantly improved financial results (Wiklund, 1998; Zahra & Covin, 1995). Previous studies observed that the different dimensions of *entrepreneurial orientation* may have differential effects on firm performance (Lumpkin & Dess, 2001). Nevertheless, *entrepreneurial orientation* can be regarded as an influential construct which has positive performance implications (Wiklund et al., 2007). Empirical evidence shows that *entrepreneurial orientation* is positively related to growth (Wiklund, 1998; Zahra & Covin, 1995). Based on the data set of 110 manufacturing firms, researchers demonstrate a positive effect of *entrepreneurial orientation* on the growth rate of sales (Covin, Green & Slevin, 2006). Wiklund and Shepherd (2005) also found that *entrepreneurial orientation* has an impact on growth and financial performance and such effect has been moderated by environment dynamism and capital availability. *Entrepreneurial orientation* is becoming an overarching determinant since future business environment requires firms to seek new opportunities to survive and grow. Firms which can sustain or enhance their *entrepreneurial orientation* over a period can achieve better results than their competitors and may experience high growth rates (Madsen, 2007).

### **2.2.3. Firm specific resources**

Based on a resource-based view, *financial resources* and *human capital* are the most important resources for small business growth (Wiklund et al., 2007). It has been argued that securing fi-

*financial resources* might be particularly important in promoting firm growth (Bamford, Dean & McDougall, 1997; Sexton & Bowman-Upton, 1991). It is because *financial resources* can relatively easily be converted into other types of resources (Dollinger, 1999). With sufficient resources, firms are able to experiment new things, which not only increases their innovation potential but also enables the business to pursue new growth opportunities (Castrogiovanni, 1996; Zahra, 1991). Empirical studies show that access to *financial resources* has a positive effect on small business growth (Cooper et al., 1994; Storey, 1994). Financial performance of a firm is a secondary input to the *financial resources* for firms. Profit yielded in the past can be reinvested into the firm. By this means, a firm not only relies on external funding, but instead also uses internal funds to finance investments.

Coad (2007) argues that financial performance can be expected to correspond to firm growth given the principle of 'growth of the fitter' from evolutionary theory. Following this logic, only firms with superior financial performance can grow. However, the empirical evidence on this phenomenon still remains ambiguous. While some studies show significantly positive relationship between financial performance and growth (Bottazzi & Secchi, 2005), others find only moderate effects (Coad, 2007) and even some negative effects (Hardwick & Adams, 2002). The rationale behind this is that there are a large number of unexplained variations in the growth rate (Coad, 2007).

*Human capital* represents knowledge, skills and experience. On a organizational level, human capital of the total workforce plays a more determined role when compared to the entrepreneur alone (Birley & Westhead, 1990; Chandler & Hanks, 1994). Employees are considered as the most important resource for SMEs. Knowledge of individuals plays a crucial role in building competitive advantage of a firm. Small firms are more likely to engage in innovation activities due to their constraints in available resources, and therefore high quality workforce and further human resource development within the organization is rather important for such firms. Rauch, Frese and Utsch (2005) conducted an empirical analysis based on longitudinal data from 119 German business owners and found that human resources is the most important factor predicting growth of SMEs.

#### **2.2.4. Organizational structure**

As described above, human resources, in other words labour, is considered as the most important input for SMEs (Heskel, 1999; Rauch et al., 2005). It is therefore that organizational structure, which concerns the distribution of tasks among labour units and the coordination mechanism between labour units, is relevant to the firm's growth (Athey & Roberts, 2001; Chaston, 1997; Jensen & Meckling, 1992; Mintzberg, 1979). Though different dimensions are used by various authors to describe distribution of tasks, *centralization*, *formalization* and *departmentalization* are commonly agreed dimensions (Burton & Obel, 1998; Dewar, Whetten & Boje, 1980; Geeraerts, 1984; Mintzberg, 1979; Pugh & Hickson, 1976; Robbins, 1990). *Centralization* represents the degree to which authorities of decision making are delegated throughout an organization; it is the opposite of *decentralization* (Aiken & Hage, 1968). *Formalization* refers to the extent to which organizational rules, procedures, authority relationship, communication, and norms are defined (Hall, Haas & Johnson, 1967). Formalization along with *standardization* and *coordination* are utilized to control and optimize organizational procedures. *Departmentalization* is normally measured by the number of departments involved in organizational activities or by the number of managerial levels (Jaworski & Kohli, 1993; Meijaard, Brand & Mosselman, 2005).

Adopting from previous concepts, Meijaard et al. (2005) examined the relationship between five structural dimensions, namely *departmentalization*, *specialization*, *decentralization*, *coordination*, and *formalization*, and performance of Dutch SMEs. They found that to a certain extent, formalization and standardization overlapped in their data set, specialization derives two dimensions in terms of task and skill. Firms with a decentralized structure generally perform well regardless of their size, but to their surprise centralized structure also turned to be performing equally well. Hierarchical, centralized structure with strictly specialized employees turned out to perform well in terms of growth (Hart & Moore, 1999; Meijaard et al., 2005). In addition, firm with specialization were found to be larger (Garicano & Hubbard, 2003; Meijaard et al., 2005). Although the effect of

organizational structure on firm growth is rather complex due to the dependencies on other factors such as firm size, sector, and organizational configuration, it is suggested that including them in studies could give a better understanding of the determinants of firm growth.

### **2.2.5. Dynamic capability**

Due to constraints in resources, SMEs have to reconfigure, reallocate, and recombine their resources to achieve desired goals. The firm's ability to do this is referred to as dynamic capability (Eisenhardt & Martin, 2000; Teece, Pisano & Shuen, 1997). Given the purpose of operationalization, we define dynamic capability as strategic routines (for example, R&D and new product development) and strategic decision making (for example, entering into a new market) which aims at achieving new resource combinations to yield firm growth (Eisenhardt and Martin, 2000). It has been argued that dynamic capability is crucial for small firms to successfully exploit and create new opportunities (Zahra, Sapienza & Davidsson, 2006). In this paper, we operationalize dynamic capability with *organizational learning* and a firm's *scalability*.

*Organizational learning* serves similar aim of knowledge creation as does R&D. While R&D brings in or creates explicit and technical knowledge within firms, organizational learning externalizes the tacit knowledge embedded into individuals and specific groups to organizational knowledge. Knowledge is a key source of a firm's competitive advantage (Barney, 1991; Grant, 1991) and it is especially crucial for innovation (Cohen & Levinthal, 1990). Through learning processes, an organization's stock of knowledge can be created and expanded. Consequently, overall quality of organizational knowledge can be leveraged (Hult et al., 2003). The notion of *organizational learning* can be described as processes or activities of learning in the organization (Örtenblad, 2001). Managers see organizational learning as a powerful tool to exploit their knowledge resources and in turn to improve the performance of their organizations. An effective learning process involves several phases, such as acquisition, interpretation, transfer, and reconstruction (Hanssen-Bauer & Snow, 1996). Hult et al. (2003) capture three aspects of learning process: the value of cross-functional teamwork, the interconnectedness of various parts of the organization, and the mechanisms for knowledge sharing. Their empirical analysis indicates a significantly positive relationship between organizational learning and firm performance.

Scalability is sparsely discussed in the growth literature. The term originates from the telecommunication and software engineering (Bondi, 2000). An analogous meaning has been implied in the business context, as a desirable capability to either handle growing amounts of work or to be readily enlarged. In this paper, we relate the term scalability with a firm's preparedness to grow. Scalability of a firm implies that the underlying business model offers the potential for firm growth. A firm's business model is a coherent framework that converts firm's resources and capabilities through customers and markets into economic value (Chesbrough & Rosenbloom, 2002). An effective business model is a firm's ability to recombine its resources, structure and strategy to yield valuable organizational outcomes (Teece, 2007). Firm growth is a likely outcome of an effective business model. We thus hypothesize that scalability of "a firm's business model" is positively related to firm growth.

## **2.3. Environmental Determinants**

A general finding in literature is that most firms start small, live small and die small. One major reason for this is that a majority of the business start-ups are imitative businesses in mature industries that serve local markets (Audretsch & Mahmood, 1994; Baldwin & Gellatly, 2003). Samundsson and Dahlstrand (2005) studied 262 young Swedish technology based firms and found that firms seeking to exploit opportunities based on new market knowledge are less likely to attain substantial growth than firms seeking to exploit opportunities based on existing market knowledge.

Dess and Beard (1984) show that the environment varies along several dimensions, such as dynamism, heterogeneity, hostility and munificence, and this may largely determine the growth potential of firms. These dimensions are adopted and further developed to investigate their effects on small firms (Covin & Covin, 1990; Kolvereid, 1992; Pelham & Wilson, 1996). *Dynamic environ-*

ment, either market dynamics or technology dynamics, is measured by the level of environmental predictability (Houston, 1986). It is argued that there are more opportunities for growth when there are changes in society, politics, market and technology (Wiklund et al., 2007). *Munificence* represents an environment's support (for example, great market potential) for firm growth (Aldrich & Wiedenmayer, 1993). A firm in such an environment with better access to required resources has higher chances to grow. Unfortunately, a previous study shows a slightly significant direct effect of munificence on firm growth (Baum et al., 2001). *Hostile environment* can create threats to the firm through increased intensity of competition. *Competitive intensity* (Houston, 1986) thus reduces the growth opportunities for small firms. *Heterogeneity* indicates the complexity of environment regarding the concentration or dispersion of organizations in the environment. It is argued that small firms which serve niche markets can find growth opportunity with relatively more ease in a heterogeneous market than in a homogeneous one (Wiklund et al., 2007).

## 2.4. Growth Barriers

While the aforementioned determinants generally facilitate firm growth, there are also factors that hinder potential growth (Davidsson, 1989). Such factors are titled as growth barriers. It is argued that SMEs are more likely to face entry barriers and growth barriers compared to their large counterparts. Commonly addressed barriers for small businesses include *institutional barriers* and *financial barriers*. *Institutional barriers* are mainly discussed with the focus on firms' interaction with government, including legalization, taxation, and government support amongst others. Based on consistent results from both theoretical and empirical data, Davidsson and Henreksson (2002) strongly argue that certain institutions intentionally discriminate against the growth of SMEs which in turn act as a growth barrier. It is not difficult to imagine that SMEs would have a tough period when they face unfavourable tax system, discriminatory regulations and complicated laws.

*Financial barriers* represent lack of financial resources. It has been argued that credit constraints, lack of external debt, and equity capital are the main obstacles to the growth of SMEs (Becchetti & Trovato, 2002; Pissarides, 1998; Riding & Haines, 1998). Evidence suggests that banks are more conservative when they provide loans to SMEs. Due to the information asymmetries, SMEs are more likely to be charged relatively high interest rates and asked for high collateral and loan guarantees (Stiglitz & Weiss, 1981). Furthermore, SMEs could also face external barriers, internal organizational barriers and social barriers which cover aspects of market position of a firm, access to qualified human capital, and access to network (Bartlett & Bukvič, 2001).

## 2.5. Hypotheses

We have extensively discussed the determinants of firm growth from three dimensions—namely individual, organizational and environmental determinants. We also discuss the determinants that act as growth barriers. It is observed that growth is a rather complex phenomenon which can hardly be determined by one group of determinants. There are interactions between certain determinants which yield moderated or mediated effects, which subsequently impacts firm growth (e.g. Baum et al., 2001; Wiklund et al., 2007). As described in this section, there exist a substantial number of determinants that might have a relationship with firm growth. This leads to an equal number of hypotheses which depict positive, negative, or no relationship between a determinant and firm growth. In order to offer a simplistic view on these determinants derived from literature review and the respective hypothesized relationship with firm growth, we have summarized them in Table 1.

INSERT TABLE 1 ABOUT HERE

### 3. DATA, VARIABLES AND METHODOLOGY

In this section, we first discuss data and sample selection. An econometric model of the empirical analysis is present in the methodology part. Techniques applied to generate factors for selected determinants are discussed. In the end, variables used in this study are defined.

#### 3.1. Sample and Data Collection

This paper makes use of a firm-level data set which is composed on the basis of an extensive questionnaire regarding determinants and firm growth discussed in the previous section. Furthermore, there are several measures of growth available, such as employment, turnover, and profit. Respondents were randomly selected amongst Dutch entrepreneurs. Data was collected via several rounds of telephone (computer-aided) interviews by EIM Business Policy and Research in 2005. Approximately 1100 Dutch entrepreneurs were also asked to report their employment, turnover, and profit both in 2005 and in 2003. This gives an opportunity to calculate the relative growth.

The sample is stratified according to sector and size. The sector classification contains the five main sectors of the Dutch economy: manufacturing (International Standard Industrial Classification code D), construction (ISIC code F), trade (ISIC codes G, H), transport & communication (ISIC code I), and services (ISIC codes J, K, N, O, P). Due to our interest in SME growth, our specific sample only includes independent firms that have less than 250 employees. Since not all the respondents finished the questionnaire completely, some of the data points were missing. We thus exclude the cases with missing values and eventually this results in a final data set consisting of 523 firms.

#### 3.2. Methodology

We use a multivariate linear regression model to test the influence of the determinants listed in Table 1 on firm growth:

$$\text{Growth} = \alpha + \beta_1 \text{determinant} + \beta_2 \text{Barrier} + \beta_3 \text{control} + \varepsilon,$$

where Growth denotes variables of relative growth in employment; determinants includes variables/factors of individual, organizational and environmental determinants; barriers covers variables/factors of growth barriers; control represents control variables.

Most questions of our selected determinants are measured on a seven-point Likert scale. To construct factors from the questions corresponding to these determinants, we use Factor Analysis (FA). We test for reliability using the Cronbach-alpha reliability coefficient and calculate the correlations between the variables. All the empirical analyses were executed using SPSS 14.0.

Two approaches were adopted to construct factors for the determinants; we named them the *conceptual approach* and the *statistical approach*. In the *conceptual approach*, we determine a priori with the help of our knowledge from the literature review, which question(s) of the questionnaire is (are) used to measure a determinant. Subsequently, using confirmatory factor analysis, we combined the questions into different factors which correspond to the determinants. The reliabilities of the factors are tested by the Cronbach-alpha reliability coefficient. Only factors with a Cronbach-alpha above 0.6 are retained. In the *statistical approach*, we rely on the data and the outcome of the analysis irrespective of its theoretical basis. In other words, we examine the data in an exploratory manner. Using exploratory factor analysis, we group the questions into factors solely on statistical grounds. Again, we used a Cronbach-alpha of above 0.6 to decide whether a factor is reliable.

#### 3.3. Variables

In this sub-section, the dependent variable, independent variables, as well as control variables are discussed.

### 3.3.1. Dependent Variable

The dependent variable is firm growth. Firm growth can be measured by several attributes such as turnover/sales, employment, assets, market shares, and profits. Among these measures, sales and employment are in particular broadly used indicators for growth (Ardishvili, Cardozo, Harmon & Vadakath, 1998; Davidsson, 1991; Delmar, 1997; Weinzimmer, Nystrom & Freeman, 1998; Wiklund, 1998). This is because growth in sales and employment reflect both short-term and long-term changes in a firm and they are easy to obtain. Furthermore, compared to other indicators such as market shares, sales and employment are more objective measures (Delmar, 1997). Our data set contains several indicators of firm growth such as employment, turnover, and profit. However, the response rates to different indicators differ. In order to maximize our sample for the empirical analysis, we thus use growth in employment as an indicator of firm growth in this study. There are also different ways in measuring growth, for instance absolute growth and relative growth. Relative growth is commonly used in studies of firm growth (Birch, 1987; Delmar, Davidsson & Gartner, 2003; Shepherd & Wiklund, 2009), and it is usually measured by the growth rate in percentage terms. With the available information on employment in both 2005 and 2003, we can calculate the relative growth in employment and use it as the dependent variable in the regression model. As a consequence, our dependent variable includes information of both positive and negative growth. The average growth rate in our sample is 35%.

### 3.3.2. Independent Variables

The independent variables include factors and individual variables representing individual determinants, organizational determinants, environmental determinants, and growth barriers. The *conceptual* and the *statistical* approaches result into two sets of factors as independent variables, consisting of 14 reliable factors and 16 reliable factors, respectively. [Appendix A](#) provides a detailed description of the factors and variables that resulted from both approaches. Comparing the results of the two approaches, there is a slight difference in the specification of generated factors.

Individual determinants include personal traits, growth motivation, individual competencies, and personal background. In both the conceptual and the statistical approach, the same factors are generated for *need for achievement* (Cronbach  $\alpha=0.70$  with 3 items), *risk taking propensity* (Cronbach  $\alpha=0.78$  with 3 items) and *self-efficacy* (Cronbach  $\alpha=0.87$  with 8 items). Instead of a 4-item factor of *experience* (Cronbach  $\alpha=0.75$ ) in the conceptual approach, the statistical approach suggests a 3-items factor of *industrial experience* and a variable regarding *entrepreneurial experience*. The 3-item factor improves the reliability to 0.85.

With respect to the *organizational determinants*, the factors resulting from Factor Analysis differ between the two approaches. Only the factor of *financial performance* (Cronbach  $\alpha=0.70$  with 3 items) appears to be the same in both the approaches. Four other factors generated in the conceptual approach are *market orientation* (Cronbach  $\alpha=0.85$  with 8 items), *entrepreneurial orientation* (Cronbach  $\alpha=0.78$  with 5 items), *preparedness to grow* (Cronbach  $\alpha=0.74$  with 3 items), and *organizational learning* (Cronbach  $\alpha=0.81$  with 6 items). Using the statistical approach, a new factor called *formalization* (Cronbach  $\alpha=0.60$  with 3 items) is generated. *Market orientation* (Cronbach  $\alpha=0.85$  with 9 items) captures one more dimension, but the reliability of the factor does not improve. *Entrepreneurial orientation* and *preparedness to grow* in the conceptual approach are combined into one factor (Cronbach  $\alpha=0.84$  with 8 items) while using the statistical approach. The new factor has the highest reliability coefficient. *Organizational learning* is split into two factors: *learning orientation* (Cronbach  $\alpha=0.80$  with 4 items) and *team orientation* (Cronbach  $\alpha=0.61$  with 2 items) in the statistical approach. The reliability of this two factors solution was found to be lower than the one factor solution in the conceptual approach.

Both the conceptual and the statistical approaches yield the same factors for competitive intensity (Cronbach  $\alpha=0.87$  with 2 items) and Munificence (Cronbach  $\alpha=0.69$  with 3 items) among environmental determinants. Market dynamism (Cronbach  $\alpha=0.71$  with 2 items), technology dynamism and heterogeneity (Cronbach  $\alpha=0.61$  with 2 items) in the conceptual approach are combined into one factor called dynamism and complexity (Cronbach  $\alpha=0.77$  with 5 items) while using the

statistical approach. In the conceptual approach, we create one factor for barriers of growth (Cronbach  $\alpha=0.90$  with 17 items), while the statistical approach yields three distinct factors: Institutional barriers (Cronbach  $\alpha=0.66$  with 3 items), financial barriers (Cronbach  $\alpha=0.68$  with 4 items) and non-institution/finance barriers (Cronbach  $\alpha=0.89$  with 12 items).

### 3.3.3. Control variables

We use 1) sector dummies; 2) organizational configuration; 3) merge experience and merge plan and 4) stage in market lifecycle, as control variables in our empirical analysis.

1) Sector dummies are a commonly used control variables. It has been proved that sector differences do matter in the empirical results. For instance, a firm in the labour-intensive sector might be more likely to engage in employment growth when compared to the less labour-intensive one. Five sectors dummies are defined in this study: manufacturing, construction, trade, transport and communication, and services.

2) Organizational configuration ranges from a simple structure to a multidivisional form, including direct, division, function, and hierarchy. Meijaard et al. (2005) indicate that the effect of organization structure is dependent on organizational configuration. We thus include organizational configuration as a control variable in this study.

3) The purpose to include ‘merge experience’ and ‘merge plan’ as control variables is that we can limit our dependent variable ‘firm growth’ to the form of organic growth. The heterogeneity of growth should not be ignored (Delmar et al., 2003). Broadly speaking, there are three forms of firm growth: organic growth, acquisition growth, and internationalization growth. Organic growth is defined as business expansion through increasing output and sales. Acquisition growth happens by means of business expansion via mergers, acquisition, or take-overs. Therefore, acquisition-based growth in itself does not directly contribute to economic growth. Internationalization growth is often based on alliances and networks and it is regarded as an entrepreneurial act since it entails the opening up of product markets (Ibeh, 2003; Thorelli, 1987). It has been argued that different forms of growth may have different determinants and effects (Delmar et al., 2003). Therefore, confining different forms of growth might be crucial while conducting an empirical analysis.

4) Stage in the market lifecycle includes new market, growing market, mature market, and shrinking market. A firm’s growth potential is dependent on market stages. For instance, a firm is more likely to grow fast in a growing market compared to the one that engages in a mature market. Therefore, stage in the market lifecycle is an important control variable.

## 4. RESULTS

Bivariate relationships are first examined using Pearson bivariate correlations. The correlation coefficients between variables are all below 0.5. Furthermore, variance inflation factor (VIF) scores are computed for each of the regressions and range from 1.14 to 2.6, thus suggesting that the analysis should not be seriously distorted by multicollinearity.

Table 2 presents the results of the examined relationship using independent variables which are generated by the *conceptual approach*. There are 39 determinants and 12 control variables included in the model. They explain 22.5% of the variation in dependent variable ‘relative growth in employment’ ( $R^2=0.225$ ; Adjust  $R^2=0.141$ ).

INSERT TABLE 2 ABOUT HERE

Seven determinants are identified to have significant impacts on firm growth. Among the *individual determinants*, specific skills ( $B=17.76$ ,  $p<0.05$ ) and growth motivation ( $B=0.28$ ,  $p<0.01$ ) are positively conducive to firm growth while need for achievement ( $B=-10.34$ ,  $p<0.05$ ) shows a negative relationship. Among the *organizational determinants*, preparedness to grow ( $B=10.22$ ,

$p < 0.05$ ), financial performance ( $B = 14.42$ ,  $p < 0.001$ ) and extra finance ( $B = 15.23$ ,  $p < 0.10$ ) have positive impacts on firm growth. Firm age ( $B = -10.34$ ,  $p < 0.05$ ) contributes negatively to firm growth. There were no significant determinants found among the *environmental determinants*. The value of  $R^2$  change ( $\Delta R^2$ ) differed between dimensions; it indicates that *organizational determinants* explain the most variation of relative growth in employment ( $\Delta R^2 = 0.098$ ), followed by *individual determinants* ( $\Delta R^2 = 0.057$ ). *Environmental determinants* explain the least variation of employment growth ( $\Delta R^2 = 0.023$ ).

Results using the independent variables from the *statistical approach* are demonstrated in Table 3. In total, 34 determinants and 12 control variables are included in the regression analysis. They explain 21.3% of the variation in dependent variable ‘relative growth in employment’ ( $R^2 = 0.213$ ; Adjust  $R^2 = 0.135$ ).

INSERT TABLE 3 ABOUT HERE

Among the *individual determinants*, need for achievement, specific skills and growth motivation are again identified to be significant determinants of firm growth. Need for achievement ( $B = -10.37$ ,  $p < 0.05$ ) has a negative impact while the rest, specific skills ( $B = 17.10$ ,  $p < 0.05$ ) and growth motivation ( $B = 0.30$ ,  $p < 0.01$ ), has a positive influence on firm growth. Among the *organizational determinants*, firm age again turns out to be a negative determinant of firm growth ( $B = -0.37$ ,  $p < 0.05$ ). Preparedness to grow ( $B = 9.76$ ,  $p < 0.10$ ) and financial performance ( $B = 15.50$ ,  $p < 0.001$ ) show a positive relationship with firm growth. We do not find any significant determinants among the *environmental determinants*. The value of  $\Delta R^2$  varies between dimensions. Similar to the finding from the conceptual approach, determinants from organizational dimensional explain the most variation of relative growth in employment ( $\Delta R^2 = 0.086$ ), followed by the determinants from individual dimension ( $\Delta R^2 = 0.05$ ). Determinants from environment dimension explain the least variation ( $\Delta R^2 = 0.02$ ).

Comparing the results of the two approaches, we conclude that both approaches yield more or less similar results. Table 4 summarizes the findings from the conceptual and the statistical approach. Determinants that were found to have a significant influence (at 10% significant level) on firm growth are tabulated. Apparently, most of the results seem to be sufficiently robust: they do not alter with a slight difference in specification of variables or factors.

INSERT TABLE 4 ABOUT HERE

## 5. DISCUSSION AND LIMITATIONS

In this paper we investigate the determinants of firm growth. Based upon a review of the literature, we summarize the determinants and classify them into three dimensions: individual, organizational and environmental determinants. This gives an opportunity to evaluate the importance of the three dimensions as well as all underlying determinants. We identify the most important determinants of firm growth using a simple model.

Next to the extensive literature review, this paper makes an empirical contribution to the growth literature. Seven determinants – growth motivation, specific skills, need for achievement, firm age, financial performance, extra finance, and preparedness to grow – are found to be most important for firm growth. The first three are individual and the last four are organizational determinants. There are thus no environmental determinants with a significant contribution, implying that environmental determinants do not affect firm growth while the individual ones do. Organizational determinants have the greatest influence on firm growth. Our findings support the path-dependency feature of firm growth (Nelson & Winter, 1982; Coad, 2009).



Most of our empirical findings support previous studies. Among the individual determinants, our empirical results show a positive relationship between growth motivation and firm growth. It is consistent with the motivation theory (Delmar, 1996). It has been argued that a motivated entrepreneur will perform better in firm growth since he/she will devote more time and energy (Davidsson, 1989; Kolvereid, 1992). Our empirical results also show that the entrepreneur's specific skills, specifically the technical background, have a significant impact on firm growth. From a learning perspective, entrepreneurs with technical background can learn managerial skills via daily operations. However, it may be more difficult for a non-technical entrepreneur to understand the technical aspects. Furthermore, technically accomplished entrepreneurs are more aware of the technical opportunities. Our findings support that technical competency is an important expertise which facilitates the implementation of the entrepreneur's vision and strategy (Baum et al., 2001).

Among the organizational determinants, a negative effect of firm age on firm growth is found in our empirical study. This is in line with the view that younger firms feel the urge to reach the minimum efficiency scale and thereby exhibit higher growth rates compared to the older ones. The empirical results also show that both extra finance and financial performance are positively related to firm growth. This finding is in line with previous studies (Cooper et al., 1994; Storey, 1994). Availability of capital is crucial for firm growth because it can be converted into other types of resources. Firms with secured financial resources are able to experiment which consequently yields new opportunities for growth (Bamford et al., 1997; Castrogiovanni, 1996; Dollinger, 1999; Sexton & Bouman-Upton, 1991; Zahra, 1991). The positive relationship between availability of capital and employment growth is also straightforward. The hiring of new employees will result into an increase in a firm's costs. Hence a firm will not be able to expand without a precondition of sufficient finance.

Contrary to previous studies, our empirical findings show that 'need for achievement' as an entrepreneurial trait has a negative effect on firm growth. Our explanation is that entrepreneurs in our sample may have high 'need for achievement' in other entrepreneurial goals such as improved performance, quality, higher profit margin, etc., rather than promoting employment growth. One of the novel findings of our empirical study is that there exists a positive relationship between preparedness to grow (as a firm's business model) and firm growth. A firm's business model has been sparsely discussed in the existing growth literature as an important determinant. A business model is a coherent framework that converts firm's resources and capabilities into economic value (Chesbrough & Rosenbloom, 2002). An effective business model is a firm's ability to recombine its resources, structure, and strategy to yield valuable organizational outcomes (Teece, 2007). Firm growth is a likely outcome of an effective business model. This finding provides practical implications for entrepreneurs: entrepreneurs with growth ambitions should not only be solely based on a competitive strategy; they should also rationally evaluate the overall capabilities of the firm, in other words whether resources and organization structures of the firm are prepared for firm growth.

To conclude, our study shows that firm growth is a complex phenomenon. It can not be explained by one particular dimension or one determinant. The most important determinants have been identified from the individual and organizational dimensions. Organizational determinants have the greatest influence on firm growth. The path-dependency feature of firm growth has been identified. Most of our empirical results are consistent with previous studies except for the 'need for achievement'. Our study also indicates that preparedness to growth, as embedded in a firm's business model, is a more important determinant than, for instance, a firm's strategy.

The limitations of the present study are the following: first, we develop a simple model which does not account for moderation and mediation effects. Several other studies that use a limited number of explanatory variables indeed indicate an existence of moderation or mediation effects between different determinants (Baum et al., 2001; Wiklund et al., 2007). Our empirical findings should be interpreted as a starting point to develop a more complex model to test those effects. Second, we use employment growth as a dependent variable. This limits the explanatory power of this study. It has been argued that sales growth would be a better initiating factor for growth (Flamholtz,

1986). Future study should include sales growth as a dependent variable. Also it will be more insightful if the interlinks between different growth indicators can be investigated. Third, the cross-sectional nature of the data does not allow for dynamic aspects. The current setup can be extended to a longitudinal setup in future research.

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**Table 1: Determinants of growth and hypothesized relationship with growth**

Category	Determinants from Literature Review	Expected relationship <sup>(a)</sup>
<b>INDIVIDUAL DIMENSION</b>		
Personal traits	Need for achievement	+
	Risk taking propensity	+
	Internal locus of control	+
	External locus of control	-
	Self-efficacy	+
Motivation	Extraversion (including Sociability)	+
	Growth motivation	+
Individual competencies	Managerial skills	0
	Specific skills	+
Personal background	Individual age	-
	Gender	+/-
	Education	+
	Experience	+
<b>ORGANIZATIONAL DIMENSION</b>		
Firm attributes	Firm age	-
	Firm size	-
Organizational structure	Centralization	+
	Decentralization	+
	Formalization	0
	Standardization	0
	Specialisation (task or skills)	+
	Departmentalization	+
Strategies	Market orientation	+
	Entrepreneurial orientation	+
Firm specific resources	Financial capital availability	+
	Human resource development	+
	Finance performance	+
Dynamic capabilities	Organizational learning	+
	Business model (preparedness to grow)	+
<b>ENVIRONMENTAL DIMENSION</b>		
	Market dynamism	+
	Technology dynamism	+
	Heterogeneity	+
	Competitive intensity	-
	Munificence	+
<b>GROWTH BARRIERS</b>		
	Barriers	-

a. All the hypotheses are developed from the literature review; '+' = positive relationship, '-' = negative relationship, '0' = no significant relationship

**Table 2: Regression results on determinants based on the conceptual approach**

<i>Factors/Variables</i>	<i>Conceptual determinants</i>	
	<i>Coefficient</i>	<i>t-value</i>
Constant	15.62	0.43
<b>INDIVIDUAL DIMENSION</b>		
<b>Need for achievement</b>	<b>-10.53*</b>	<b>-2.41*</b>
<b>Risk taking propensity</b>	-1.14	-0.29
Internal locus of control	2.59	1.12
External locus of control	-1.18	-0.47
Fatalistic	-0.33	-0.12
Sociability	1.48	0.60
Extraversion	-1.52	-0.56
<b>Self efficacy</b>	-5.27	-1.06
<b>Experience</b>	-3.80	-0.91
Specific skills	<b>17.76*</b>	<b>2.09*</b>
Managerial skills	2.47	0.31
Individual age	0.004	0.16
Gender (Male=1)	5.66	0.70
Education	10.35	1.34
Growth motivation	<b>0.28**</b>	<b>2.63**</b>
<b>ORGANIZATIONAL DIMENSION</b>		
Firm age	<b>-0.38*</b>	<b>-2.07*</b>
Firm size	-13.73	-1.61
Centralization	1.12	0.54
Decentralization	0.68	0.29
Standardization	-0.80	-0.39
Formalization	3.23	1.65
Specialisation (tasks)	-0.20	-0.09
Specialisation (skills)	-0.40	-0.20
Departmentalization	0.10	0.03
<b>Market orientation</b>	3.29	0.63
<b>Entrepreneurial orientation</b>	0.52	0.10
<b>Preparedness to growth</b>	<b>10.22*</b>	<b>2.10*</b>
<b>Organizational learning</b>	2.48	0.54
<b>Financial performance</b>	<b>14.42***</b>	<b>3.57***</b>
Extra finance	<b>15.23<sup>†</sup></b>	<b>1.67<sup>†</sup></b>
Financial bottleneck	-8.58	-0.78
Human resource development	0.02	0.52
<b>ENVIRONMENTAL DIMENSION</b>		
<b>Competitive intensity</b>	-0.72	-0.17
<b>Market Dynamism</b>	5.30	1.08
Technology turbulence	-0.49	-0.20
Technology stability	-1.33	-0.69
<b>Munificence</b>	2.78	0.58
<b>Heterogeneity</b>	1.07	0.26
<b>GROWTH BARRIERS</b>		
<b>Growth barriers</b>	1.90	0.44
<b>CONTROL VARIABLES</b>		
Merge experience	-7.89	-0.38
Merge plan	8.09	0.74
Division structure	-14.42	-0.52
Hierarchy structure	6.37	0.32
Function structure	<b>-23.11<sup>†</sup></b>	<b>-1.86<sup>†</sup></b>
Manufacture	<b>-20.00<sup>†</sup></b>	<b>-1.73<sup>†</sup></b>
Construct	-13.54	-0.78
Trade	-13.02	-1.36
Transport&communication	6.45	0.41
New market	<b>24.19<sup>†</sup></b>	<b>1.81<sup>†</sup></b>
Grow market	9.16	0.60
Shrink market	10.29	1.21
<i>R</i> <sup>2</sup>	0.225	
<i>Adjusted R</i> <sup>2</sup>	0.141	

†: P<0.1; \*: P<0.05; \*\*: P<0.01; \*\*\*: P<0.001

**Table 3: Regression results on determinants based on the statistical approach**

<i>Factors/Variables</i>	<i>Statistical determinants</i>	
	<i>Coefficient</i>	<i>t-value</i>
Constant	21.34	0.72
<b>INDIVIDUAL DIMENSION</b>		
<b>Need for achievement</b>	<b>-10.37**</b>	<b>-2.43**</b>
<b>Risk taking propensity</b>	-0.77	-0.20
Internal locus of control	2.34	1.01
External locus of control	-1.13	-0.45
Fatalistic	-1.13	-0.41
<b>Self efficacy</b>	-6.40	-1.35
<b>Industrial experience</b>	-4.37	-1.05
Entrepreneurial experience	5.46	0.60
Specific skills	<b>17.10*</b>	<b>2.04*</b>
Managerial skills	3.25	0.41
Individual age	0.003	0.11
Gender (Male=1)	5.47	0.67
Education	9.82	1.29
Growth motivation	<b>0.30**</b>	<b>2.85**</b>
<b>ORGANIZATIONAL DIMENSION</b>		
Firm age	<b>-0.37*</b>	<b>-2.01*</b>
Firm size	-11.48	-1.36
Centralization	0.86	0.42
Decentralization	0.76	0.32
<b>Formalization_S</b>	3.52	0.87
Specialisation (skills)	-0.93	-0.47
Departmentalization	0.29	0.08
<b>Market orientation_S</b>	2.82	0.53
<b>Preparedness to growth_S</b>	<b>9.76<sup>†</sup></b>	<b>1.81<sup>†</sup></b>
<b>Learning orientation</b>	0.74	0.17
<b>Financial performance</b>	<b>15.50***</b>	<b>3.86***</b>
<b>Team orientation</b>	4.06	0.96
Human resource development	0.02	0.43
<b>ENVIROMENTAL DIMENSION</b>		
<b>Competitive intensity</b>	-0.80	-0.19
<b>Dynamism &amp; complexity</b>	4.05	0.87
Technology stability	-0.91	-0.49
<b>Munificence</b>	3.51	0.74
<b>GROWTH BARRIERS</b>		
<b>Non-institutional/finance barriers</b>	2.18	0.44
<b>Finance barriers</b>	1.50	0.37
<b>Institution barriers</b>	-0.11	-0.03
<b>CONTROL VARIABLES</b>		
Merge experience	-7.22	-0.35
Merge plan	10.40	0.95
Division structure	-13.45	-0.49
Hierarchy structure	3.08	0.16
Function structure	<b>-21.91<sup>†</sup></b>	<b>-1.77<sup>†</sup></b>
Manufacture	<b>-21.35<sup>†</sup></b>	<b>-1.86<sup>†</sup></b>
Construct	-12.83	-0.74
Trade	-12.88	-1.37
Transport&communication	7.14	0.45
New market	<b>23.93<sup>†</sup></b>	<b>1.78<sup>†</sup></b>
Grow market	9.65	1.14
Shrink market	-7.01	-0.43
<i>R<sup>2</sup></i>	<i>0.213</i>	
<i>Adjusted R<sup>2</sup></i>	<i>0.135</i>	

†: P<0.1; \*: P<0.05; \*\*: P<0.01; \*\*\*: P<0.001

**Table 4: Summary of significant determinants of growth**

Determinants	Relationship
<b>Need for achievement</b>	-
Specific skills	+
Growth motivation	+
Firm age	-
<b>Financial performance</b>	+
<b>preparedness to growth</b> <sup>b</sup>	+
Extra finance <sup>c</sup>	+

a. The determinants are significant with the presented sign in both approaches unless otherwise stated.

b. In the statistical approach the corresponding determinant preparedness to growth is significant as well.

c. Only significant in the conceptual approach.

## 6. Appendix A: Definition of regression variables

**Table A.1. Definition of regression variables in the conceptual approach**

Regression variables <sup>(a)</sup>	Questions in the questionnaire
<b>INDIVIDUAL DIMENSION</b>	
<b>Need for achievement</b> (3 items, $\alpha=.70$ )	- Even if I have achieved something, I want to become better - I like to compare myself with others - I do everything in order to reach my goal
<b>Risk taking propensity</b> (3 items, $\alpha=.78$ )	- I love gambling - I dare to take action, even though it will be risky - I am ready to take risk
Internal locus of control	- Result of my business is strongly dependent on my own effort
External locus of control	- I often have feeling that I can not influence the thing happen to me
Fatalistic	- Often making a decision can even be done by tossing with a coin.
Sociability	- After working time I often meet professionally relevant persons (customer, advicer, etc)
Extraversion	- Talking to strangers is easy for me
<b>Self efficacy</b> (8 items, $\alpha=.87$ )	- I can make good strategic choices - In discussions I come up with the important part - I am open for new and non-traditional ideas. - I usually lead the implementation of new ideas, products/services and processes - I ask questions that nobody else asks - I set up goals for myself and work according to these goals - In my work I concentrate on the work that has to be done to achieve my goals or the company goals - I am goal oriented
<b>Experience</b> (4 items, $\alpha=.75$ )	- How many years of working experience do you have in the industry in which your current business is engaged? - How many years did you work in this business? - How many years' working experience do you have? - Do you have entrepreneurial experience before you come to work in this business?
Specific skills	- Technical education
Managerial skills	- Management/economics education
Individual age	- What is your birth of year?
Gender (Male=1)	- What is your gender?
Education	- What is the highest degree you obtained?
Growth motivation	- If your business can develop as you expected in the coming years, what do you expect the increase of employment in 2007
<b>ORGANIZATIONAL DIMENSION</b>	
Firm age	- In which year do you start your business?
Firm size	- How many full time employees in your business in 2005? (Categorical variable)
Centralization	- Most decisions have to be made by managers
Decentralization	- Employees are allowed to make decision themselves
Standardization	- The intended result of the work is specified in advance
Formalization	- Working procedure is written down
Specialisation (tasks)	- Every employee does some specific tasks
Specialisation (skills)	- Employees have function which only they can fulfill
Departmentalization	- How many management levels within your business?
<b>Market orientation</b> (8 items, $\alpha=.85$ )	- We measure customer satisfaction structurally and periodically. - Helping and satisfying customers is the most important for us. - We often discuss about how competitors do - Management team often discuss the strong point of competitors - We often share information about client wishes internally.

<p><b>Entrepreneurial orientation</b> (5 items, <math>\alpha=.78</math>)</p>	<ul style="list-style-type: none"> <li>- All our internal procedures and rules are focused on fulfilling the needs in the market.</li> <li>- We are always busy with customer needs that will emerge after some years.</li> <li>- We focus on acquiring new customers with new needs.</li> <li>- We search actively for innovative product/service concept and new production processes.</li> <li>- We undertake the actions to which other companies must react</li> <li>- Our slogan is "defeating our competitors"</li> <li>- Compared to other business, we take a lot of risk</li> <li>- We react strongly and offensively to the actions of competitors</li> </ul>
<p><b>Preparedness to grow</b> (3 items, <math>\alpha=.74</math>)</p>	<ul style="list-style-type: none"> <li>- We are prepared for a strong growth of our business.</li> <li>- With the current organization structure and business resources, we can easily grow with 20%</li> <li>- Within our company, everyone knows that we want to grow fast.</li> </ul>
<p><b>Organizational learning</b> (6 items, <math>\alpha=.81</math>)</p>	<ul style="list-style-type: none"> <li>- Everyone here agrees with the common goal</li> <li>- We have a strong team feeling</li> <li>- Employees' training is an investment, its not a cost</li> <li>- Learning is according to us the key to make things better</li> <li>- We make enough free time to learn from the mistakes we made</li> <li>- We study the successful and unsuccessful business activities and discuss with each other about it</li> </ul>
<p><b>Financial performance</b> (3 items, <math>\alpha=.70</math>)</p>	<ul style="list-style-type: none"> <li>- How would you describe the profitability of your company on average in the last five years?</li> <li>- How did the turnover develop in the last five years</li> <li>- How do you judge your financial performance compare to the important competitor in your sector?</li> </ul>
<p>Extra finance</p> <p>Financial bottleneck</p> <p>Human resource development</p>	<ul style="list-style-type: none"> <li>- Do you think that you need extra finance in the coming 2yrs</li> <li>- Do you experience bottlenecks in the financing of your business?</li> <li>- How many training hours have your employees had in the last 2 years</li> </ul>
<b>ENVIRONMENTAL DIMENSION</b>	
<p><b>Competitive intensity</b> (2 items, <math>\alpha=.87</math>)</p>	<ul style="list-style-type: none"> <li>- Our market share is threatened by intensive competition</li> <li>- Our market is characterized by strong competition.</li> </ul>
<p><b>Market Dynamism</b> (2 items, <math>\alpha=.71</math>)</p>	<ul style="list-style-type: none"> <li>- Customers constantly look for new product/service</li> <li>- Products and services become old very fast in our market</li> </ul>
<p>Technology turbulence</p>	<ul style="list-style-type: none"> <li>- In our market, you must often update technology in order to stay in the market.</li> </ul>
<p>Technology stability</p>	<ul style="list-style-type: none"> <li>- The technology that our business is based on, is not subject to large changes</li> </ul>
<p><b>Munificence</b> (3 items, <math>\alpha=.69</math>)</p>	<ul style="list-style-type: none"> <li>- There is uncultivated market potential in our market</li> <li>- In which degree are there profit and growth opportunities in your market?</li> <li>- Our most important market grow fast</li> </ul>
<p><b>Heterogeneity</b> (2 items, <math>\alpha=.61</math>)</p>	<ul style="list-style-type: none"> <li>- Questions and preference of customers are unpredictable</li> <li>- Customers differ strongly in buying behaviour</li> </ul>
<b>GROWTH BARRIERS</b>	
<p><b>Growth barriers</b> (17 items, <math>\alpha=.90</math>)</p>	<ul style="list-style-type: none"> <li>- Attract and keep qualified personal</li> <li>- Getting the cash flow</li> <li>- Access to new market</li> <li>- Keep up with technological development</li> <li>- Difficulties with inventory and suppliers</li> <li>- Increase management workload</li> <li>- Find right advices</li> <li>- Get right knowledge/suitable technology</li> <li>- Degree of competitiveness</li> <li>- Development of market volume</li> <li>- Set up suitable organization structure</li> <li>- Get the access to relations and relevant networks</li> <li>- Lack of support from banks</li> <li>- Difficult to obtain the capital</li> <li>- Find a right (production/sales) location</li> <li>- Legalization</li> <li>- Lack of support from government</li> </ul>

## CONTROLS

Merge experience	- Did your company merge with others in the past 2 years?
Merge plan	- Do you have merge plan for the coming 2 years?
Division structure	- Which one of following does describe the internal organization of your business? Division structure, hierarchy structure, function structure or direct structure. (Dummies, using direct structure as reference group)
Hierarchy structure	
Function structure	
Manufacture	- Which sector does your business belong to? Manufacture, construct, trade, transport&communication or service. (Sector dummies, using service as reference group)
Construct	
Trade	
Transport & communication	
New market	- Which market does your business engage in? New market, grow market, mature market or shrink market. (Dummies, using mature market as reference group)
Grow market	
Shrink market	

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a. If a variable is constructed by factor analysis, it is formatted in **bold** and the Cronbach alpha is in parentheses. Only factors with an alpha > 0.6 are taken into the regression analysis.

**Table A.2. Definition of different regression variables in the statistical approach**

Variables <sup>(a)</sup>	Definition
<b>INDIVIDUAL DIMENSION</b>	
<b>Industrial experience</b> (3 items, $\alpha=.85$ )	Three questions from the factor of experience in the conceptual approach <ul style="list-style-type: none"> <li>- <i>How many years of working experience do you have in the industry in which your current business is engaged?</i></li> <li>- <i>How many years did you work in this business?</i></li> <li>- <i>How many years' working experience do you have?</i></li> </ul>
Entrepreneurial experience	One question from the factor of experience in the conceptual approach <ul style="list-style-type: none"> <li>- <i>Do you have entrepreneurial experience before you come to work in this business?</i></li> </ul>
<b>ORGANIZATIONAL DIMENSION</b>	
<b>Formalization_S</b> (3 items, $\alpha=.60$ )	Combination of standardization, formalization and specialisation (tasks) in the conceptual approach
<b>Market orientation_S</b> (9 items, $\alpha=.85$ )	Questions from the factor of market orientation in the conceptual approach plus the following one: <ul style="list-style-type: none"> <li>- <i>We are well known for our product/service introduction</i></li> </ul>
<b>Preparedness to grow_S</b> (8 items, $\alpha=.84$ )	Combination of the factor of entrepreneurial orientation and the factor preparedness to growth in the conceptual approach
<b>Learning orientation</b> (4 items, $\alpha=.80$ )	Four questions from the factor of organizational learning in the conceptual approach <ul style="list-style-type: none"> <li>- <i>Employees' training is an investment, its not a cost</i></li> <li>- <i>Learning is according to us the key to make things better</i></li> <li>- <i>We make enough free time to learn from the mistakes we made</i></li> <li>- <i>We study the successful and unsuccessful business activities and discuss with each other about it</i></li> </ul>
<b>Team orientation</b> (2 items, $\alpha=.61$ )	Two questions from the factor of organizational learning in the conceptual approach <ul style="list-style-type: none"> <li>- <i>Everyone here agrees with the common goal</i></li> <li>- <i>We have a strong team feeling</i></li> </ul>
<b>ENVIRONMENTAL DIMENSION</b>	
<b>Dynamism and complexity</b> (5 items, $\alpha=.77$ )	Combination of the factor of market dynamism, technology turbulence and the factor of heterogeneity in the conceptual approach
<b>GROWTH BARRIERS</b>	
<b>Non institutional/finance barriers</b> (12 items, $\alpha=.89$ )	Twelve questions from the factor of growth barriers in the conceptual approach <ul style="list-style-type: none"> <li>- <i>Attract and keep qualified personal</i></li> <li>- <i>Getting the cash flow</i></li> <li>- <i>Access to new market</i></li> <li>- <i>Keep up with technological development</i></li> <li>- <i>Difficulties with inventory and suppliers</i></li> <li>- <i>Increase management workload</i></li> <li>- <i>Find right advices</i></li> <li>- <i>Get right knowledge/suitable technology</i></li> <li>- <i>Degree of competitiveness</i></li> <li>- <i>Development of market volume</i></li> <li>- <i>Set up suitable organization structure</i></li> <li>- <i>Get the access to relations and relevant networks</i></li> </ul>
<b>Institutional barriers</b> (3 items, $\alpha=.66$ )	Three questions from the factor of growth barriers in the conceptual approach <ul style="list-style-type: none"> <li>- <i>Find a right (production/sales) location</i></li> <li>- <i>Legalization</i></li> <li>- <i>Lack of support from government</i></li> </ul>
<b>Finance barriers</b> (4 items, $\alpha=.68$ )	Two questions from the factor of growth barriers, combining with extra finance and financial bottleneck in the conceptual approach <ul style="list-style-type: none"> <li>- <i>Lack of support from banks</i></li> <li>- <i>Difficult to obtain the capital</i></li> <li>- <i>Do you think that you need extra finance in the coming 2yrs</i></li> <li>- <i>Do you experience bottlenecks in the financing of your business?</i></li> </ul>

a. If a variable is constructed by factor analysis, it is formatted in **bold** and the Cronbach alpha is in parentheses. Only factors with an alpha > 0.6 are taken into the regression analysis.



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