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Determinants of Small Firm Growth: An Exhaustive Analysis Using Conceptual and Statistical Approaches

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Abstract. Firm growth is a recurring topic in the field of management and entrepreneurship research. Over the last two decades, determinants of firm growth have been studied to explain variations in growth rates from a broad array of disciplines. Nevertheless, it is observed that accumulated knowledge of firm growth is still limited. The field of study is fragmented because different disciplines produce diverse sets of determinants; however, none of them can be used as a common set of growth predictors. This paper aims to provide an exhaustive analysis on the determinants of firm growth using both conceptual and statistical approaches. Applying factor analysis on a Dutch firm-level data set that includes many known determinants of firm growth from existing literature, we create determinants that are in line with their conceptual constructs (conceptual approach). We also empirically validate the conceptual constructs of these known determinants using a statistical approach where independent variables are grouped into common factors solely on statistical grounds. Finally, using an inclusive model consisting of known determinants from various categories, we are able to identify the most important determinants of firm growth: the individual's growth motivation and specific (technical) skills, firm age, past financial performance of the firm and the firm's entrepreneurial-growth orientation. We suggest that these determinants can serve as a common set of determinants to develop a more systematic analysis on the determinants of firm growth in future research.

Keywords: firm growth, growth determinants, individual determinants, organizational determinants, environmental determinants, Dutch firm-level data.

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1. Introduction

Growth of small and medium-sized enterprises (SMEs) is important for job creation (Haltiwanger et al., 2013; Huber et al., 2017). SMEs that grow enjoy an increasing likelihood of survival and benefit from economies of scale resulting from their growth (Daunfeldt et al., 2016). It is therefore useful from both a political and a business perspective to gain further insight into the determinants of firm growth. Firm growth is a recurring topic in the field of management and entrepreneurship research. Over the last two decades, researchers studied the determinants of firm growth in a broad array of disciplines such as economics, strategy, psychology, network theory and innovation. They aim at explaining the variation of growth rates and seek to identify different growth paths fit for particular circumstances (Coad et al., 2013). Nevertheless, it is observed that our knowledge of firm growth is still limited, and the accumulation of such knowledge is notably slow (Davidsson and Wiklund, 2000; Wiklund et al., 2009; Lockett et al., 2011). This is partially due to the fact that different disciplines produce diverse sets of determinants. The field of study is thus fragmented and lacks a common set of predictors that is able to explain what determines firm growth in a holistic manner.

Firm growth is an organizational outcome that results from the combination of firm-specific resources, which is complex and path-dependent (Nelson and Winter, 1982). A firm's growth opportunities are highly related to its current organizational production activities (Coad, 2009) as well as to the environmental conditions like competition and market dynamics which can make the degree of growth uncertain (Coad et al., 2013). In addition, for small firms, growth can be influenced by an entrepreneur's personal ambition and expectations of the firm's promising performance (Siepel et al., 2017). Not every entrepreneur aims to grow his/her business (Meijaard et al., 2002). Although a number of studies attempt to link determinants from different perspectives or dimensions (Baum et al., 2001; Ibhagui and Olokoyo, 2018; Welsh et al., 2018), their explanatory power is often low due to the relatively small number of variables (Davidsson et al., 2006).

This paper addresses the current limitations in the field of study and aims to provide an exhaustive assessment of the determinants of firm growth using both conceptual and statistical approaches. Next to an extensive review on the determinants of firm growth, we adopt the approach of Baum et al. (2001) and classify many known determinants into three categories: individual determinants, organizational determinants and environmental determinants. We also include a fourth category of 'negative' determinants: growth barriers (Flamholtz, 1986). Using a Dutch firm-level data set that consists of information on known determinants from a wide range of perspectives, we construct two sets of determinants from the four categories: one set is based on their conceptualized constructs that are identified from the existing literature (conceptual approach); another set is allowing the freedom of measurement to construct determinants

purely on statistical grounds, i.e. in an exploratory manner (statistical approach). By so doing, we validate the determinants' constructs by comparing the two approaches. Moreover, we empirically identify the most important determinants by estimating two regression models where firm growth is explained from our two sets of determinants.

The paper contributes to the existing literature in several ways. *First*, an extensive literature review summarizes and classifies many known determinants from different existing perspectives. *Second*, it is one of few empirical studies that integrates as many determinants as possible into a single model.[2] *Third*, we empirically validate the known determinants proposed by the existing literature and identify the most important determinants of firm growth. We suggest that these determinants can serve as a common set of determinants to develop a more systematic analysis in future research.

The rest of the paper is structured as follows. In section 2, 3, 4 and 5, we conduct a systematic literature review on the determinants of firm growth in the sequence of individual, organizational, and environmental determinants, and finally growth barriers. In section 6, we describe the research methodology regarding data collection, sampling, scale construction and model testing. We present the results of our empirical analysis in section 7. Finally, in section 8 we discuss key findings and implications for future research.

2. Individual Determinants

Firm growth is to a certain extent a matter of decisions made by an individual entrepreneur. Previous studies indicated that an entrepreneur's personality traits (Nicholson, 1998), growth motivation (Delmar, 1996), individual competencies (Baum et al., 2001) and personal background (Welter, 2001) such as age and gender are the most important determinants of firm growth (Shane et al., 2003).

Personality Traits

The Big Five model (Johnson, 1990; Barrick and Mount, 1991; Hurtz and Donovan, 2000) is often used and identified as a robust indicator of an individual's personality. The Big Five factors – Extraversion, Neuroticism, Agreeableness, Conscientiousness and Openness to experience – are generally agreed among personality theorists as representative personality traits or characteristics (Judge et al., 1999; South et al., 2018). It has been argued that the Big Five can 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:

2. Cressy and Bonnet (2018) apply a similar approach when explaining firm *survival* (rather than firm *growth* as in the current paper).

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 confirmed the important role of need for achievement in explaining entrepreneurial activity (Staniewski et al., 2016). 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 is 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 and Schøtt, 2004). Similar evidence has also been found at the individual level by Cassar (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 in the early years have not shown any significant role of risk taking propensity in entrepreneurial activities (Litzinger, 1961; Kogan and Wallach, 1964; Low and Macmillan, 1988; Babb and Babb, 1992; Palich and Bagby, 1995). The reason behind such a weak relation might be that entrepreneurs have different perceptions of risks (Corman et al., 1988; Fry, 1993; Sarasvathy et al., 1998). Based on the relationship between risk taking propensity and growth ambition, we propose a positive impact of risk taking propensity on actual firm growth.

Locus of control: Locus of control is the belief of an individual to what extent their actions or personal characteristics affect outcomes. 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). While internal locus of control is mostly regarded as a beneficial trait, Pinger et al. (2018) offer a new perspective which argues that there might be circumstances where internal locus of control leads to inefficient behaviours that may damage relevant economic growth.

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). Goal orientation and openness are considered important attributes of self-efficacy. It is well known that higher goals often lead to better performance results than moderate or low goals (Locke and 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 venture success. Self-efficacy has also 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 a negative situation (Shane et al., 2003). He/she knows how to continuously improve based on feedback and previous experience. 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 is a predictor of firm growth.

Extraversion: Extraversion is primarily associated with the quantity and intensity of building and maintaining relationships, and requires active engagement with high energy levels, positive emotion and excitement (DeNeve and Cooper, 1998). It has been used originally as an indicator of job performance for managers and sales people (Barrick and Mount, 1991; Vinchur et al., 1998). Extraversion 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 et al., 2004). Morrison et al. (2003) observed that extraversion is strongly related to the performance of franchisees. *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 and Greening, 1998). Baron and Markman (2000) argued 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 the venture. We can thus suggest a positive relationship between extraversion/sociability and firm growth.

Growth Motivation

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* which plays a rather important role in

an entrepreneur's behaviour which in turn contributes to actual growth (Delmar, 1996). Delmar (1996) argues that an entrepreneur who has greater growth 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 economically 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 rationale 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 (Meijaard et al., 2002). Several studies across various countries (Cliff, 1998; Dennis and Solomon, 2001; Human and Matthews, 2004; Delmar and Davidsson, 2006; Clark et al., 2014) also demonstrate that most business founders have modest growth aspirations, which in turn has a direct effect on firm growth. Therefore, incorporating growth motivation of an entrepreneur is crucial in determining firm growth.

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 label them managerial skills. Specific competencies include technical and industrial skills. Having conducted 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.

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; Verheul, 2018). 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 and Henrekson, 2000; De Vita et al., 2014) while others do find that female-owned businesses grow less (Fischer et al., 1993; Cooper et al., 1994).

Nevertheless, we propose that male entrepreneurs are more likely to engage in actual growth compared to female entrepreneurs.

Age is another important factor that influences growth ambition. Results of previous studies indicate a significantly negative relation between age and growth ambition (Autere and 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 and Grimm, 1997; Welter, 2001). Based on the previous evidence, we argue that the older the entrepreneur, the less likely he/she is to grow the firm.

Earlier research also shows that an entrepreneur's experience with industry and any prior entrepreneurial experience have a positive impact on firm performance. Orser et al. (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 entrepreneurs know how to find required resources and how these resources can be appropriately utilized for current business (Ripsas, 1998; Shepherd et al., 2000; Delmar and Shane, 2006). Entrepreneurs with prior entrepreneurial experience have much clearer ideas of necessary roles and responsibilities in organizations (Ericsson and Smith, 1991). By learning from previous mistakes, experienced entrepreneurs can be more effective in managing the new venture (Ripsas, 1998; Shepherd et al., 2000; Burke et al., 2018). 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. Based on the aforementioned arguments, we thus 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 engages in. The social network within the industry may help them to obtain first important commitment from suppliers and customers, which is 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; Hallak et al., 2018). Hence, we can conclude that industry experience has a positive influence on firm growth.

Although it is observed that a high education level has a positive impact on firm performance in terms of growth (Storey, 1994; Sapienza and Grimm, 1997), 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 (2000), 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 opportunities and resources, 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 and 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.

3. Organizational Determinants

Firm growth is defined as an increase in certain attributes, such as sales, employment, and/or profit of a firm between two points in time (Hakkert and Kemp, 2006). Firm growth can be determined by the 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; Stevenson and Jarillo, 1990; Nickell, 1996; Nickell et al., 1997; Fan, 2018; Grillitsch et al., 2018). Thus, organizational determinants play an important role. The following determinants have been frequently discussed in previous studies from various disciplines: firm attributes, market orientation, entrepreneurial orientation, growth orientation, firm specific resources and capabilities including human capital, financial resources and organization learning, and organizational structure.

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 and 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 among various countries and industries (Glancey, 1998; Liu et al., 1999; Robson and Bennett, 2000;

Geroski and Gugler, 2004; Reichstein and Dahl, 2004; Yasuda, 2005; Haltiwanger et al., 2013).

The stylized fact of *firm size* has been found in the industrial economics 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 (Dunne and Hughes, 1994; McPherson, 1996; Almus and Nerlinger, 2000; Goddard et al., 2002; Bottazzi and Secchi, 2003; Calvo, 2006). 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 and Gebreeyesus, 2007). Therefore, we suggest that there exists a negative relationship between firm size and growth especially for firms with less than 400 employees.[3]

Market Orientation

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 (Yayla et al., 2018). 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 (Narver and Slater, 1990; Hult et al., 2003; Acosta et al., 2018). There are several ways of defining market orientation. *First*, Kohli and Jaworski (1990) identify three sets of activities, namely market intelligence generation, intelligence dissemination, and responsiveness. *Second*, a framework focused on organizational culture defines market orientation along dimensions of customer orientation, competitor orientation and inter-functional coordination (Narver and Slater, 1990). Regardless of the various definitions of market orientation, empirical studies do show that market orientation is significantly related to the overall performance of a firm (e.g. Jaworski and Kohli, 1993).

Entrepreneurial Orientation

Entrepreneurial orientation is defined as *innovation*, *proactiveness* and *risk taking* at the firm level and reflects a firm's degree of entrepreneurship (Miller, 1983). The concept is further developed into five dimensions with the additional dimensions of *autonomy* and *competitive aggressiveness* (Lumpkin and Dess, 1996, 2001). *Innovation* refers to a willingness to support creativity and

3. Haltiwanger et al. (2013) and Lawless (2014) suggest though that it is firm age, rather than firm size, that influences firm growth.

experimentation in introducing new products/services and novelty, technological leadership, and R&D in developing new processes. *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. *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. *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. *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 (Lumpkin and Dess, 1996, 2001).

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 (Zahra and Covin, 1995; Wiklund, 1998; Wiklund et al., 2009; Martens et al., 2018). Empirical evidence shows that entrepreneurial orientation is positively related to growth (Zahra and Covin, 1995; Wiklund, 1998). Based on a data set of 110 manufacturing firms, researchers demonstrate a positive effect of entrepreneurial orientation on the growth rate of sales (Covin et al., 2006). Wiklund and Shepherd (2005) also found that entrepreneurial orientation has an impact on growth and financial performance while 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).

Growth Orientation

Similar to entrepreneurial orientation, *growth orientation*, which is one of the eight dimensions of Stevenson's entrepreneurial management (Stevenson, 1983), can also reflect a firm's degree of entrepreneurship. Brown et al. (2001) found that entrepreneurial management only partly overlaps with entrepreneurial orientation. According to their study, both of them turn to be conceptually sound, but empirically they are distinct aspects of entrepreneurship (Brown et al., 2001).

Stevenson's entrepreneurial management is defined as a set of opportunity-based management practices by which entrepreneurs can achieve their aims, irrespective of their personal intentions, and regardless the resources they currently control and uncertainty about environment incentives and future outcomes. (Stevenson, 1983; Stevenson and Gumpert, 1985; Stevenson and

Jarillo, 1986; 1990). It has been argued that entrepreneurial management can help firms sustain their competitive advantage and affect the likelihood of a positive outcome (Stevenson and Jarillo, 1990; Brown et al., 2001). We thus hypothesize that growth orientation might be a positive determinant of firm growth.

Firm-Specific Resources and Capabilities

Based on a resource-based view, *financial resources* and *human capital* are the most important resources for small business growth (Wiklund et al., 2009). It has been argued that securing financial resources might be particularly important in promoting firm growth (Sexton and Bowman-Upton, 1991; Bamford et al., 1997). This 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 (Zahra, 1991; Castrogiovianni, 1996). Empirical studies show that access to financial resources has a positive effect on small business growth (Cooper et al., 1994; Storey, 1994).

Past 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 a significantly positive relationship between financial performance and growth (Bottazzi and Secchi, 2005), others find only moderate effects (Coad, 2007) and even some negative effects (Hardwick and Adams, 2002). The explanation is that there are a large number of unexplained variations in the growth rate (Coad, 2007).

Human capital represents knowledge, skills and experience. On an organizational level, human capital of the total workforce plays a more determined role when compared to the entrepreneur alone (Birley and Westhead, 1990; Chandler and Hanks, 1994). Individuals' knowledge plays a crucial role in building competitive advantage of a firm (Felício et al., 2014). Managers and professionals are more likely to accumulate tacit knowledge that are crucial for innovation and growth (Gidehag and Lodefalk, 2017). Therefore, selection of a highly qualified workforce with growth ambitions (Siepel et al., 2017) and further development of human resources within the organization are important capabilities that a firm should possess. Rauch et al. (2005) conducted an empirical analysis based on longitudinal data from 119 German business owners and found that human resources are the most important factor predicting growth of SMEs.

Organizational learning serves a 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 and 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). 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 and 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.

Organizational Structure

As already described, human resources, in other words labour, is considered the most important input for SMEs (Heskel, 1999; Rauch et al., 2005). Therefore, organizational structure that concerns the distribution of tasks among labour units and the coordination mechanism between labour units is relevant to a firm's growth (Mintzberg, 1979; Chaston, 1997; Jensen and Meckling, 1992; Athey and Roberts, 2001). Though different dimensions are used by various authors to describe distribution of tasks, *centralization*, *formalization* and *departmentalization* are commonly agreed dimensions (Pugh and Hickson, 1976; Mintzberg, 1979; Dewar et al., 1980; Geeraerts, 1984; Robbins, 1990; Burton and Obel, 1998). *Centralization* represents the degree to which authorities of decision making are delegated throughout an organization; it is the opposite of *decentralization* (Aiken and Hage, 1968). *Formalization* refers to the extent to which organizational rules, procedures, authority relationship, communication, and norms are defined (Hall et al., 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 and Kohli, 1993; Meijaard et al., 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, while

specialization comprised two dimensions in terms of task and skill. Firms with a decentralized structure generally perform well regardless of their size, but to their surprise firms with a centralized structure also turned out to be performing equally well. Firms using a hierarchical, centralized structure with strictly specialized employees turned out to perform well in terms of growth (Hart and Moore, 2005; Meijaard et al., 2005). In addition, firms with specialization were found to be larger (Garicano and 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.

4. Environmental Determinants

A general finding in the literature is that most firms start small, live small and die small. One major reason for this is that a majority of business start-ups are imitative businesses in mature industries that serve local markets (Audretsch and Mahmood, 1994; Baldwin and Gellatly, 2003). Environmental inducements may thus largely determine the growth potential of firms. Dess and Beard (1984) show that the environment varies along several dimensions: dynamism, heterogeneity, hostility and munificence. These dimensions are adopted and further developed to investigate their effects on small firms (Covin and Covin, 1990; Kolvereid, 1992; Pelham and Wilson, 1996). A *dynamic environment*, either referring to 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., 2009). *Munificence* represents an environment's support (for example, great market potential) for firm growth (Aldrich and Wiedenmayer, 1993). A firm in such an environment with better access to required resources has higher chances to grow. Nevertheless, a previous study shows only a slightly significant direct effect of munificence on firm growth (Baum et al., 2001). A *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 the environment regarding the concentration or dispersion of organizations in the environment. It is argued that small firms which serve niche markets can find growth opportunities with relatively more ease in a heterogeneous market than in a homogeneous one (Wiklund et al., 2009).

5. 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* (Bartlett and Popovski, 2015). *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 Henrekson (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 an unfavourable tax system, discriminatory regulations and complicated laws.

Financial barriers represent lack of financial resources (Gill and Biger, 2012). It has been argued that credit constraints, lack of external debt, and lack of equity capital are the main obstacles to the growth of SMEs (Riding and Haines, 1998; Pissarides, 1999; Becchetti and Trovato, 2002). Evidence suggests that banks are more conservative when they provide loans to SMEs. Due to information asymmetries, SMEs are more likely to be charged relatively high interest rates and asked for high collateral and loan guarantees (Stiglitz and Weiss, 1981). Furthermore, SMEs could also face external barriers, internal organizational barriers (Flamholtz and Brzezinski, 2016) and social barriers which cover aspects of the market position of a firm, access to qualified human capital, and access to networks (Bartlett and Bukvič, 2001).

To summarize, we have extensively discussed the determinants of firm growth from three dimensions—namely individual, organizational and environmental determinants. We have also further discussed 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., 2009). As described in the previous sections, there are a substantial number of determinants that might have a relationship with firm growth. This leads to an equal number of hypotheses which depict a positive, negative, or no relationship between a determinant and firm growth. The determinants derived from our literature review and the respective hypothesized relationships with firm growth, are summarized in Table 1.

Table 1. Determinants of growth and hypothesized relationship with growth

Category	Determinants from literature review	Expected relationship[(a)]
INDIVIDUAL DIMENSION		
Personality traits	Need for achievement	+
	Risk taking propensity	+
	Internal locus of control	+
	Self-efficacy	+
	Extraversion (including Sociability)	+
Motivation	Growth motivation	+
Individual competencies	Managerial skills	0
	Specific skills	+
Personal background	Individual age	-
	Gender	+/-
	Education	+
	Experience	+
ORGANIZATIONAL DIMENSION		
Firm attributes	Firm age	-
	Firm size	-
Organizational structure	Centralization	+
	Formalization	0
	Standardization	0
	Specialisation (task or skills)	+
	Departmentalization	+
Strategies	Market orientation	+
	Entrepreneurial orientation	+
	Growth orientation	+
Firm specific resources	Financial capital availability	+
	Human resource development	+
	Past finance performance	+
Dynamic capabilities	Organizational learning	+
ENVIRONMENTAL DIMENSION		
	Market dynamism	+
	Technology dynamism	+
	Heterogeneity	+
	Uncertainty	+
	Competitive intensity	-
	Munificence	+
GROWTH BARRIERS		
	Barriers	-

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

6. Methodology

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 of firm growth discussed in the previous sections. Furthermore, there are several measures of growth available, expressed in terms of 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 and Policy Research[4] 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 rate.

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 (the European Union's cut-off for SMEs). 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 this eventually results in a final data set consisting of 523 firms.

Within our sample, the average age of respondent firms is about 23 years old; about half of them belong to the services sector. About 60% of respondent firms are micro firms with less than 10 employees. Thus, the sample is somewhat overrepresented by relatively small companies in the services sector. However, controlling for company age, size and sector differences is expected to offset this problem, at least in part.

Scale Construction and Variables

Most questions of our selected determinants are measured on a seven-point Likert scale (varying from 1 ‘not at all applicable’ to 7 ‘totally applicable’). To construct multi-item variables, we used a combination of techniques, including factor analysis, testing for reliability using the Cronbach-alpha reliability coefficient, and a check for face validity. Items were combined into factors using the Statistical Package for the Social Sciences (SPSS). Appendix A provides a more extensive description of each variable.

Two approaches were adopted to construct factors for the determinants; we labelled them the *conceptual approach* (A) and the *statistical approach* (B). 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

4. EIM Business and Policy Research is now part of Panteia.

measure a determinant. Subsequently, using factor analysis, we combined the questions into different factors which correspond to the determinants on the basis of the theoretical dimensions. The reliabilities of the factors are tested by the Cronbach-alpha reliability coefficient. Only factors with a Cronbach-alpha around or above 0.65 are retained (Nunnally, 1967). 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 factor analysis, we group the questions into factors solely on statistical grounds. Then we check whether reliable factors are in line with the theoretical dimensions that were summarized in the literature review. Appendix A and B provides a detailed description of the factors and variables that resulted from both approaches.

Dependent variable

In this study, we use relative changes in employment over a two-year period as an indicator of firm growth. We calculate this variable based on employment levels in 2003 and 2005: $((y_{2005}-y_{2003})/y_{2003})$.[5] Our dependent variable includes both positive and negative growth rates. The average relative growth rate in our sample is 36% (median value is 9.8%). The mean value of relative growth is high in our sample. This is mainly due to the following facts (see Table 2): (1) micro firms at 75% percentile grow more than 60%; (2) substantial growth also occurs among firms of bigger sizes, i.e. small firms at 90% percentile grow more than 70% and medium firms at 90% percentile grow more than 470%. Some of these high-growth observations reflect mergers and acquisitions which we control for in our regression analysis by means of a control variable (see subsection Control Variables). Relative growth in employment is commonly used in studies of firm growth (Birch, 1987; Delmar et al., 2003; Shepherd and Wiklund, 2009). This is because employment is an objective measure that reflects both short-term and long-term changes in a firm and is easy to obtain (Delmar, 1997).

Table 2. Relative changes in employment per firm size group

Firm size group	Mean	Median	Min	Max
All SMEs	36%	9.8%	-87.5%	772%
Micro (between 1 and 9 employees)	39%	0%	-87.5%	600%
Small (between 10 and 49 employees)	28%	18%	-45%	500%
Medium (between 50 and 249 employees)	102%	17%	-25%	772%

Independent Variables

The independent variables include factors and individual variables representing individual determinants, organizational determinants, environmental

5. In our questionnaire, employment is defined as the number of full-time employees in service in the business by the end of 2003/2005. Full-time refers to employees working 32 hours or more per week.

determinants, and growth barriers. The *conceptual* and *the statistical* approaches result into two sets of factors as independent variables, consisting of 13 reliable factors and 14 reliable factors, respectively.[6] Appendix B provides a detailed description of the difference between factors resulting from both approaches.

Individual determinants include personality traits, growth motivation, individual competencies, and personal background. In both the conceptual and the statistical approaches, the same factors are generated for *need for achievement* (Cronbach α=0.70 with 3 items)*, risk taking propensity* (Cronbach α=0.78 with 3 items) and *self-efficacy* (Cronbach α=0.87 with 8 items). Instead of a 4-items factor of *experience* (Cronbach α=0.75) in the conceptual approach, the statistical approach suggests a 3-items factor of *industrial experience* and an individual variable for *entrepreneurial experience* (see Appendix B). This 3-items factor improves the reliability to 0.85. In addition to the factors, the rest of individual determinants, i.e. internal locus of control, sociability, extraversion, individual competencies, individual's age, gender, education and growth motivation, are represented by individual variables in the empirical analysis (see Appendix A).

With respect to the organizational determinants, the factors differ between the two approaches. Only the factor of *past financial performance* (Cronbach α=0.70 with 3 items) appears to be the same. There are four other factors generated by the conceptual approach (see Appendix A): *market orientation* (Cronbach α=0.85 with 8 items)*, entrepreneurial orientation* (Cronbach α=0.78 with 5 items)*, growth orientation* (Cronbach α=0.74 with 3 items)*,* and *organizational learning* (Cronbach α=0.81 with 6 items). Using the statistical approach, *Market orientation_S (*Cronbach α=0.85 with 9 items*)* captures one more dimension, but the reliability of this factor does not improve. *Entrepreneurial orientation* and *growth orientation* in the conceptual approach are combined into one factor (Cronbach α=0.84 with 8 items). We name it *entrepreneurial-growth orientation*. This new factor has the highest reliability coefficient compared to the two-factors solution that resulted from the conceptual approach. Instead of a 6-items factor, the statistical approach suggests a 4-items factor for *Organizational learning_S* (Cronbach α=0.80), see Appendix B. In addition, the rest of organizational determinants, i.e. firm age and size, organizational structures, and firm-specific resources, appear as individual variables in the empirical analysis (see Appendix A).

Both the conceptual and the statistical approaches yield the same factors for *competitive intensity* (Cronbach α=0.87 with 2 items) and *Munificence* (Cronbach α=0.69 with 3 items) among environmental determinants. *Market dynamism* (Cronbach α=0.71 with 2 items), and the individual variables of technology turbulence, uncertainty and heterogeneity in the conceptual approach are combined into one factor called *dynamism and complexity* (Cronbach α=0.77 with 5 items) while using the statistical approach (see Appendix B).

6. These are the bold-printed regressors in Tables 3 and 4.

In the conceptual approach, we create one factor for *growth barriers* (Cronbach α=0.90 with 17 items), while the statistical approach yields three distinct factors: *institutional barriers* (Cronbach α=0.66 with 3 items), *financial barriers* (Cronbach α=0.68 with 4 items) and *non-institutional/financial barriers* (Cronbach α=0.89 with 12 items).

Control variables

The following variables are used as control variables in our empirical analysis. 1) *Sector dummies* are a commonly used set of control variables. Sector differences matter for firm growth. For instance, firms in a labour-intensive sector might be more likely to engage in employment growth when compared to firms in less labour-intensive sectors. 2) *Organizational configuration* ranges from a simple (direct or flat) structure to a multidivisional form, including 'direct', 'division', 'function', and 'hierarchy' as possible internal organizational structures. Meijaard et al. (2005) indicate that firm performance is dependent on organizational configuration. 3) *Merge experience* is used as a control variable in order to confine our dependent variable 'firm growth' to the form of organic growth. The heterogeneity of firm growth should not be ignored because different forms of growth may have different determinants and effects (Delmar et al., 2003). Broadly speaking, there are three forms of firm growth: organic growth, acquisition growth, and alliance growth. Organic growth is defined as business expansion through increasing output and sales. Acquisition growth happens by means of business expansion via mergers, acquisitions, or take-overs. Therefore, acquisition-based growth in itself does not directly contribute to economic growth. Alliance growth is often based on alliances and networks and is regarded as an entrepreneurial act since it entails the opening up of product markets (Thorelli, 1987; Ibeh, 2003). Therefore, controlling for different forms of growth is crucial while conducting empirical analysis. 4) *Stage in the market lifecycle* includes new market, growing market, mature market, and shrinking market as possible stages. 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 a firm that engages in a mature market. Therefore, stage in the market lifecycle is an important control variable.

Model to Be Tested

We attempt to identify the most important determinants by estimating two models that explain firm growth from our two sets of determinants: one set representing the conceptual approach and one set representing the statistical approach. Thus, we use a multivariate linear regression model to test the influence of the determinants on firm growth:

$$Growth = \alpha + \beta 1\ (Determinants) + \beta 2\ (Controls) + \varepsilon \qquad (1)$$

where *Growth* denotes relative growth in employment; *Determinants* is a vector of variables/factors of individual, organizational and environmental determinants, as well as growth barriers; and *Controls* represents a vector of control variables.

7. Results

Bivariate relationships are first examined using Pearson bivariate correlations. The correlation coefficients between independent variables are all below 0.5. Furthermore, variance inflation factor (VIF) scores are computed for each of the regressions and range from 1.12 to 2.53, thus suggesting that the analysis is not distorted by multicollinearity. In conclusion, multicollinearity is unlikely to be an issue (see Tables 3 and 4).

Table 3 presents the results of Model (1) (see subsection Model to Be Tested) using a set of independent variables generated by the *conceptual approach*. There are 36 determinants and 11 control variables included in the model. They explain 22.3% of the variation in the dependent variable 'relative growth in employment' (R^2=0.223; Adjusted R^2=0.146). Eight determinants are identified to have significant impacts on firm growth. Among the *individual determinants*, specific skills (B=18.52, p<0.05) and growth motivation (B=0.28, p<0.01) are positively related to firm growth whereas need for achievement (B=-10.24, p<0.05) shows a (surprisingly) negative relationship. Among the *organizational determinants*, growth orientation (B=10.35, p<0.05), past financial performance (B=14.89, p<0.01), formalization (B=3.38; p<0.10), and extra finance (B=16.59, p<0.10) have positive impacts on firm growth. Firm age (B=-0.37, p<0.05) contributes negatively to firm growth. There are no significant determinants found among the *environmental determinants*.

Table 3. Regression results explaining firm growth based on the conceptual approach

Factors/Variables	*Coefficient*	*t-value*	*VIF*
Constant	5.18	0.16	
CONTROL VARIABLES			
Merge experience	-6.19	-0.30	1.22
Division structure	-12.98	-0.48	1.19
Hierarchy structure	9.71	0.49	1.27
Function structure	-23.81†	-1.95†	1.30
Manufacturing	-19.92†	-1.74†	1.29
Construction	-16.46	-0.97	1.24
Trade	-13.08	-1.37	1.42
Transport & communication	5.20	0.33	1.13
New market	25.49†	1.92†	1.22
Growth market	10.44	1.14	1.49

Shrink market	-7.36	-0.46	1.24
INDIVIDUAL DIMENSION			
Need for achievement	-10.24*	-2.37*	1.72
Risk taking propensity	-1.01	-0.26	1.40
Internal locus of control	2.36	1.04	1.21
Sociability	-1.61	-0.60	1.49
Extraversion	1.47	0.60	1.45
Self-efficacy	-5.10	-1.02	2.18
Experience	-3.68	-0.89	1.59
Specific skills	18.52*	2.19*	1.35
Managerial skills	2.42	0.31	1.34
Individual age	0.00	0.19	1.18
Gender (Male=1)	6.78	0.85	1.26
Education	10.07	1.31	1.36
Growth motivation	0.28**	2.70**	1.55
ORGANIZATIONAL DIMENSION			
Firm age	-0.37*	-2.04*	1.41
Firm size	-13.37	-1.59	1.88
Centralization	0.87	0.43	1.21
Standardization	-0.62	-0.30	1.40
Formalization	3.38†	1.75†	1.54
Specialisation (tasks)	-0.09	-0.04	1.42
Specialisation (skills)	-0.61	-0.31	1.29
Departmentalization	-0.43	-0.12	1.58
Market orientation	3.65	0.70	2.42
Entrepreneurial orientation	0.49	0.09	2.53
Growth orientation	10.35*	2.17*	2.08
Organizational learning	2.30	0.51	1.85
Past financial performance	14.89**	3.71**	1.53
Extra finance	16.59†	1.85†	1.35
Financial bottleneck	-6.22	-0.57	1.42
Human resource development	0.02	0.61	1.16
ENVIRONMENTAL DIMENSION			
Competitive intensity	-0.36	-0.09	1.58
Market Dynamism	5.18	1.06	2.20
Technology turbulence	-0.08	-0.03	1.75
Munificence	3.15	0.66	2.13
Heterogeneity	-0.90	-0.39	1.69
Uncertainty	1.15	0.50	1.45
GROWTH BARRIERS			
Growth barriers	0.98	0.23	1.65

R2	*0.223*
Adjusted R2	*0.146*

Notes: †: p<0.1; *: p<0.05; **: p<0.01. Factors are indicated in bold; single variables in normal font.

Table 4 presents the regression results using the independent variables from the *statistical approach*. In total, 31 determinants and 11 control variables are included in the regression analysis. They explain 21.3% of the variation in the dependent variable 'relative growth in employment' (R^2=0.213; Adjust R^2=0.144). The statistical approach yields seven significant determinants and they reconfirm the findings in the conceptual approach. Among the *individual determinants*, need for achievement, specific skills and growth motivation are identified to be significant determinants of firm growth. Need for achievement (B=-10.267, p<0.05) has a negative impact whereas specific skills (B=18.06, p<0.05) and growth motivation (B=0.29, p<0.01), have a positive influence on firm growth. Among the *organizational determinants*, firm age again turns out to be a negative determinant of firm growth (B=-0.35, p<0.10). Formalization (B=3.24; p<0.10), a firm's entrepreneurial-growth orientation (B=10.45, p<0.05), and past financial performance (B=16.35, p<0.01) show a positive relationship with firm growth. We do not find any significant determinants among the *environmental determinants*.

Table 4. Regression results explaining firm growth based on the statistical approach

Factors/Variables	*Coefficient*	*t-value*	*VIF*
Constant	8.88	0.35	
CONTROL VARIABLES			
Merge experience	-6.98	-0.34	1.23
Division structure	-11.83	-0.44	1.17
Hierarchy structure	4.83	0.25	1.25
Function structure	-23.39†	-1.91†	1.30
Manufacturing	-20.17†	-1.77†	1.27
Construction	-17.84	-1.05	1.24
Trade	-13.77	-1.48	1.35
Transport & communication	4.30	0.27	1.12
New market	25.43†	1.90†	1.23
Growth market	9.97	1.19	1.48
Shrink market	-6.32	-0.39	1.26
INDIVIDUAL DIMENSION			
Need for achievement	-10.26*	-2.43*	1.65
Risk taking propensity	-0.98	-0.26	1.36
Internal locus of control	2.07	0.91	1.20
Self-efficacy	-2.58	-1.13	1.91

Industrial experience	-4.19	-1.01	1.57
Entrepreneurial experience	5.30	0.60	1.17
Specific skills	18.06*	2.16*	1.32
Managerial skills	3.65	0.46	1.33
Individual age	0.01	0.20	1.18
Gender (Male=1)	6.73	0.84	1.28
Education	10.10	1.33	1.31
Growth motivation	0.29**	2.78**	1.54
ORGANIZATIONAL DIMENSION			
Firm age	-0.35†	-1.92†	1.39
Firm size	-13.16	-1.57	1.85
Centralization	0.96	0.48	1.19
Standardization	-0.27	-0.13	1.37
Formalization	3.24†	1.69†	1.52
Specialisation (tasks)	-0.30	0.14	1.41
Specialisation (skills)	-0.64	0.32	1.28
Departmentalization	-0.33	-0.09	1.54
Market orientation_S	3.56	0.68	2.43
Entrepreneurial-growth orientation	10.45*	1.98*	2.53
Organization learning_S	1.65	0.39	1.65
Past financial performance	16.35**	4.09**	1.51
Human resource development	0.02	0.46	1.13
ENVIRONMENTAL DIMENSION			
Competitive intensity	-0.45	-0.11	1.55
Dynamism & complexity	3.91	0.84	1.93
Munificence	3.22	0.69	1.99
GROWTH BARRIERS			
Non-institutional/financial barriers	1.03	0.21	2.14
Financial barriers	2.73	0.69	1.46
Institutional barriers	-0.69	-0.16	1.62
R2	*0.213*		
Adjusted R2	*0.144*		

Notes: †: p<0.1; *: p<0.05; **: p<0.01. Factors are indicated in bold; single variables in normal font.

Comparing the results of the two approaches, we can conclude that both approaches yield more or less similar results. Table 5 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. The results seem to be robust: they do not alter with a slight difference in specification of variables or factors.

Table 5. Summary of significant determinants of firm growth

Determinants	Conceptual approach	Statistical approach
Need for achievement	-	-
Specific skills	+	+
Growth motivation	+	+
Firm age	-	-
Formalization	+	+
Past financial performance	+	+
Growth orientation	+	
Entrepreneurial-growth orientation		+
Extra finance	+	

A concern about our model specifications is that we include relatively many determinants (47 independent variables in Table 3) given the number of observations (523 observations). As a result, the ratio no. of observations / no. of independent variables is only just above 10 (which is a commonly used threshold). Therefore, as a robustness check, we used backward regression to re-run the model. The results indicate that the significant determinants identified in both conceptual and statistical approaches are selected into the final model of the backward regression. Moreover, they remain significant. We thus conclude that our findings in Tables 3 and 4 are robust. The results of this robustness check are available from the authors upon request.

Furthermore, in the statistical approach of scale construction, results show that entrepreneurial orientation overlaps with growth orientation. In order to examine whether they belong to the same underlying theoretical dimension, a separate factor analysis was performed only on the items belonging to entrepreneurial orientation (5 items) and growth orientation (3 items). All the items loaded on one factor with a majority of the loadings in the high 0.60s and up to 47% of total variance can be explained (see Table 6). Compared to separate factors, this one factor has the highest reliability with Cronbach alpha of 0.84 (see Appendix B). This indicates that all items share a high degree of variance with their respective construct. In the regression analysis, we also observed that entrepreneurial orientation alone does not affect firm growth (see Table 3). The positive effect only appears to be significant when including an additional dimension, viz. growth orientation. We thus suggest that growth orientation may be an important dimension for entrepreneurial orientation when accounting for measurement and operationalization issues.

Table 6. Factor analysis for Stevenson's growth orientation and Lumpkin & Dess's entrepreneurial orientation

Factor (explained variance)	Factor 1 (47%)
Items	
Entrepreneurial orientation	
- We search actively for innovative product/service concepts and new production processes.	0.61
- We undertake actions to which other companies must react	0.69
- Our slogan is "defeating our competitors""	0.69
- Compared to other business, we take a lot of risk	0.72
- We react strongly and offensively to the actions of competitors	0.73
Growth orientation	
- We are prepared for a strong growth of our business.	0.75
- With the current organization structure and business resources, we can easily grow with 20%	0.53
- Within our company, everyone knows that we want to grow fast.	0.74

8. Discussion and Conclusions

In this paper, we investigate the determinants of firm growth. Based upon an extensive review of the existing literature, we summarize many known determinants and classify them into four categories: individual, organizational and environmental determinants, and growth barriers. This gives an opportunity to evaluate the importance of the four categories as well as all underlying determinants. We identify the most important determinants of firm growth by estimating two regression models where firm growth is explained from two sets of determinants: one set representing a conceptual approach and one set representing a statistical approach.

Most of our empirical findings are consistent with previous studies. Among the individual determinants, our empirical results show a positive relationship between growth motivation and firm growth. This confirms the argument from the motivation theory stating that a motivated entrepreneur will perform better in terms of firm growth since he/she will devote more time and energy (Davidsson, 1989; Kolvereid, 1992; Delmar, 1996; Shane et al., 2003; Dimitratos et al., 2016). Our empirical results also show that the entrepreneur's specific skills, in particular with a technical background, have a significant impact on firm growth. From a learning perspective, entrepreneurs with a 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; Pearce, 2018).

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 levels of need for achievement in other entrepreneurial goals such as improved performance, quality, higher profit margin, etc., rather than promoting employment growth. This may apply especially for the smallest micro firms, as employing personnel is relatively burdensome for them (Coad et al., 2017).

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 efficient scale (MES) and thereby exhibit higher growth rates compared to older firms. This result is also in line with recent studies claiming that firm age is more relevant than firm size for explaining firm growth (Haltiwanger et al., 2013; Lawless, 2014). The empirical results also show that both extra finance and past financial performance are positively related to firm growth. This finding is consistent 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 (Sexton and Bowman-Upton, 1991; Zahra, 1991; Castrogiovianni, 1996; Bamford et al., 1997; Dollinger, 1999). 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. Furthermore, firms with more resources such as finance and employees would be more formalized as to achieve efficiency. Formalization of a firm is a necessary step along with the firm growth trajectory to ensure resources alignment.

One of the novel findings of our empirical study is that a positive relationship exists between growth orientation and firm growth. This finding shows that Stevenson's conceptualized entrepreneurial management does serve its aim: the existence and nature of opportunities-based management affect the likelihood of a positive outcome (Stevenson, 1983). This also indicates that entrepreneurial behaviour is not solely based on personalities. There is scope for teaching entrepreneurial behaviour.

The limitations of the present study are the following. *First*, we developed a simple linear model which does not account for moderating and mediating effects. Several other studies that use a smaller number of explanatory variables indicate an existence of moderating or mediating effects between different determinants (Baum et al., 2001; Wiklund et al., 2009). *Second*, we use employment growth as a dependent variable. This may have limited the explanatory power of this study. It has been argued that sales growth would be a better indicator for firm growth (Flamholtz, 1986), even though sales growth is often more difficult to measure in a reliable way. Nevertheless, future research should also include sales growth as

a dependent variable. Furthermore, it will be 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, and warrants caution regarding causal interpretations of our regression results. The current setup can be extended to a longitudinal setup in future research.

Though the current study has its limitations, it makes an important empirical contribution to the firm growth literature. *First*, this paper is one of few studies that integrate many known determinants and test them empirically. Although recent studies attempt to link determinants from different perspectives or dimensions (Lumpkin and Dess, 1996; Covin and Slevin, 1997; Baum et al., 2001), their explanatory power is low due to the relatively small number of variables (Davidsson et al., 2006).

Second, this paper uses both the conceptual approach and the statistical approach to theorize and validate the known constructs for the determinants of firm growth. Firm growth has been studied in a broad array of disciplines such as economics, strategy, psychology, network theory and innovation, which produce diverse sets of determinants that may theoretically overlap. Using the conceptual approach, we determine a priori with the help of our knowledge from the literature review which variables should be combined into common factors to construct determinants on the basis of the theoretical dimensions. On the contrary, using the statistical approach, we rely on the data and the outcome of the (factor) analysis irrespective of its theoretical basis. By comparing the two approaches, we are able to check whether reliable determinants from the statistical approach are in line with the theoretical dimensions that were summarized in the literature review. Thereby, we validate the underlying theoretical constructs of the known determinants, which has not been done before in a similar way in the existing literature.

Third, as a result of the second contribution, we identified the correlation between the constructs of entrepreneurial orientation and growth orientation. This finding constitutes a first link between Stevenson's entrepreneurial management (Stevenson, 1983) and firm growth literature. Firm growth literature suggests that a firm's entrepreneurial orientation explains the likelihood as well as the variation of firm growth (Madsen, 2007). However, we observe in practice that many "entrepreneurial" firms stay small and are barely profitable. This is partially due to the motivation of entrepreneurs (Delmar, 1996). Not every entrepreneur aims to have his/her business grow further once the firm reaches a minimum efficient scale. Our results suggest that an individual's growth motivation is a necessary condition for actual firm growth to occur (as we find a significant relation between this determinant and firm growth). However, motivation alone may not lead to growth if the firm lacks growth capacity, i.e. the alignment of resources, strategies and infrastructure supporting further growth. A lack of growth capacity is the main cause of growing pains within firms (Flamholtz and Brzezinski, 2016). While entrepreneurial orientation provides possible means to grow,

growth orientation aligns and provides a suitable organizational foundation to realize growth. Therefore, both an entrepreneur's growth *motivation* and entrepreneurial orientation may be necessary conditions to grow, but they only become sufficient when growth *orientation* is included. Growth orientation may thus be an additional and crucial dimension of entrepreneurial orientation in practice.

Fourth, we identify five robust and important determinants that are not only statistically significant in our regression analysis, but are also in line with previous research - the individual's growth motivation, the individual's specific (technical) skills, firm age, past financial performance of the firm and the firm's entrepreneurial-growth orientation. We suggest that these determinants can be interpreted as a common set of variables to develop a more complex model of firm growth in future research.

References:

Acosta, A.S., Crespo, Á.H., & Agudo, J.C. (2018), "Effect of market orientation, network capability and entrepreneurial orientation on international performance of small and medium enterprises (SMEs)", *International Business Review*, 27: 1128-1140.

Aiken, M., & Hage, J. (1968), "Organizational independence and intra-organizational structure", *American Sociological Review*, 33: 912-930.

Aldrich, H. E., & Wiedenmayer, G. (1993), "From traits to rates: an ecological perspective on organizational foundings", In J. A. Katz, & R. H. Brockhaus (Eds.), *Advances in entrepreneurship, firm emergence, and growth*, Vol. 1: 145-195. Greenwich, CN: JAI Press.

Almus, M., & Nerlinger, E. (2000), "Testing 'Gibrat's law' for young firms-empirical results for West Germany", *Small Business Economics*, 15: 1-12.

Athey, S., & Roberts, J. (2001), "Organizational design: decision rights and incentive contracts", *American Economic Review*, 91: 200-205.

Audretsch, D. B., Klomp, L., Santarelli, E., & Thurik, A. R. (2004), "Gibrat's law: are the services different?", *Review of Industrial Organization*, 24: 301-324.

Audretsch, D. B., & Mahmood, T. (1994), "Firm selection and industry evolution: The post-entry performance of new firms", *Journal of Evolutionary Economics*, 4: 243-260.

Autere, J., & Autio, A. (2000), "Is entrepreneurship learned? Influence of mental models on growth motivation, strategy, and growth", Paper presented at *Academy of Management Conference*.

Babb, E. M., & Babb, S. V. (1992), "Psychological traits of rural entrepreneurs", *Journal of Socio-Economics*, 21: 353-362.

Bager, T., & Schøtt, T. (2004), "Growth expectations by entrepreneurs in nascent firms, baby businesses and mature firms: analysis of GEM population data 2000-2003", In T. Bager, & M. Hancock (Eds.), *Global Entrepreneurship Monitor 2004.* Copenhagen, Denmark: Børsens Forlag, pp. 219-230.

Baldwin, J., & Gellatly, G. (2003), *Innovation strategies and performance in small firms*, Cheltenham, UK: Edward Elgar.

Bamford, C.E., Dean, T.J., & McDougall, P.P. (1997), "Initial strategies and new venture growth: An examination of the effectiveness of broad vs. narrow breadth strategies", In: *Frontiers of Entrepreneurship Research*, Wellesley, MA: Babson College.

Bandura, A. (1997), *Self-efficacy: the exercise of self control*, New York: Freeman.

Barney, J. (1991), "Firm resources and sustained competitive advantage", *Journal of Management*, 17(1): 99-120.

Baron, R. A., & Markman, G. D. (2000), "Beyond social capital: how social skills can enhance entrepreneurs' success", *Academy of Management Executive*, 14: 106-127.

Barrick, M. R., & Mount, M. K. (1991), "The big five personality dimensions and job performance: a meta-analysis", *Personnel Psychology*, 44: 1-26.

Barringer, B. R., & Greening, D. W. (1998), "Small business growth through geographic expansion: a comparative case study", *Journal of Business Venturing*, 13(6): 467-492.

Bartlett, W., & Bukvič, V. (2001), "Barriers to SME growth in Slovenia", *MOCT-MOST: Economic Policy in Transitional Economies*, 11: 177-195.

Bartlett, W., & Popovski, V. (2015), "Institutions and social networks: explaining barriers to new firm entry and growth in the EU's eastern neighbourhood", *International Review of Entrepreneurship*, 13(3): 169-186.

Baum, R. (1994), *The relation of traits, competencies, vision, motivation, and strategy to venture growth*, University of Maryland, College Park, MD.

Baum, R., Locke, E. A., & Smith, K. G. (2001), "A multidimensional model of venture growth", *Academy of Management Journal*, 44(2): 292-303.

Becchetti, L., & Trovato, G. (2002), "The determinants of growth for small and medium sized firms: the role of the availability of external finance", *Small Business Economics*, 19(4): 291-306.

Bigsten, A., & Gebreeyesus, M. (2007), "The small, the young, and the productive: determinants of manufacturing firm growth in Ethiopia", *Economic Development and Cultural Change*, 55(4): 813-840.

Birch, D. (1987), *Job creation in America: how our smallest companies put the most people to work*, New York: Free Press.

Bird, B. (1989), *Entrepreneurial behaviour*, Glenview, IL: Scott Foresman & Company.
Birley, S., & Westhead, P. (1990), "Growth and performance contrasts between 'types' of small firms", *Strategic Management Journal*, 2: 535-557.
Bottazzi, G., & Secchi, A. (2003), "Common properties and sectoral specificities in the dynamics of US manufacturing companies", *Review of Industrial Organization*, 23: 217-232.
Bottazzi, G., & Secchi, A. (2005), "Growth and diversification patterns of the worldwide pharmaceutical industry", *Review of Industrial Organization*, 26: 195-216.
Boyatzis, R. E. (1982), *The competent manager*, New York: John Wiley and Sons.
Brown, T. E., Davidsson, P., & Wiklund, J. (2001), "An operationalization of Stevenson's conceptualization of entrepreneurship as opportunity-based firm behaviour", *Strategic Management Journal*, 22(10): 953-968.
Burke, A., Millán, J.M., Román, C., & Van Stel, A. (2018), "Exploring the impact of different types of prior entrepreneurial experience on employer firm performance", *Journal of Business Research*, 90: 107-122.
Burton, R. M., & Obel, B. (1998), *Strategic organizational diagnosis and design* (2nd ed.), Boston, MA: Kluwer.
Calvo, J. L. (2006), "Testing Gibrat's law for small, young and innovating firms", *Small Business Economics*, 26: 117-123.
Campbell, C. (1992), "A decision theory model for entrepreneurial acts", *Entrepreneurship Theory and Practice*, 17(1): 21-27.
Cassar, G. (2007), "Money, money, money? A longitudinal investigation of entrepreneur career reasons, growth preferences and achieved growth", *Entrepreneurship and Regional Development*, 19: 89-107.
Castrogiovianni, G. J. (1996), "Pre-start-up planning and the survival of new small firms", *Journal of Management*, 22: 801-823.
Chandler, G. N., & Jansen, E. (1992), "The founder's self-assessed competence and venture preformance", *Journal of Business Venturing*, 7(3): 223-236.
Chandler, G. N., & Hanks, S. H. (1994), "Founder competence, the environment, and venture performance", *Entrepreneurship Theory and Practice*, 18: 77-89.
Chaston, I. (1997), "Small firm performance: assessing the interaction between entrepreneurial style and organizational structure", *European Journal of Marketing*, 31(11): 814-834.
Ciavarella, M. A., Buchholtz, A. K., Riordan, C. M., Gatewood, R. D., & Stokes, G. S. (2004), "The big five and venture survival: is there a linkage?", *Journal of Business Venturing*, 19(4): 465-483.
Clark, J. R., Murphy, C., & Singer, S. J. (2014), "When do leaders matter? Ownership, governance and the influence of CEOs on firm performance", *The Leadership Quarterly*, 25: 358-372.
Cliff, J. E. (1998), "Does one size fit all? Exploring the relationship between attitudes towards growth, gender, and business size", *Journal of Business Venturing*, 13(6): 523-542.
Coad, A. (2007), "Testing the principle of 'growth of the fitter': the relationship between profits and firm growth", *Structural Change and Economic Dynamics*, 18(3): 370-386.
Coad, A. (2009), *The Growth of Firms: A Survey of Theories and Empirical Evidence*, Northampton, MA: Edward Elgar.
Coad, A., Frankish, J., Roberts, R.G., & Storey, D.J. (2013), "Growth paths and survival chances: An application of Gambler's Ruin theory", *Journal of Business Venturing*, 28(5): 615-632.
Coad, A., Nielsen, K., & Timmermans, B. (2017), "My first employee: An empirical investigation", *Small Business Economics*, 48(1): 25-45.
Cohen, W., & Levinthal, D. (1990), "Absorptive capacity: a new perspective on learning and innovation", *Administrative Science Quarterly*, 35: 128-152.
Cooper, A. C., Gimeno-Gascon, F. J., & Woo, C. Y. (1994), "Initial human and financial capital as perdictors of new venture performance", *Journal of Business Venturing*, 9: 371-395.
Corman, J., Perles, B., & Vancini, P. (1988), "Motivational factors influencing high-technology entrepreneurship", *Journal of Small Business Management*, 26(1): 36-42.
Covin, J. G., & Covin, T. J. (1990), "Competitive aggressiveness, environmental context, and small firm performance", *Entrepreneurship Theory and Practice*, 13: 35-50.

Covin, J. G., Green, K. M., & Slevin, D. P. (2006), "Strategic process effects on the entrepreneurial orientation-sales growth rate relationship", *Entrepreneurship Theory and Practice*, 30(1): 57-81.

Covin, J. G., & Slevin, D. P. (1997), "Strategy Formation Patterns, Performance, and the Significance of Context", *Journal of Management*, 23(2): 189-209.

Cressy, R. & Bonnet, J. (2018), "The long-run impact of bank lending constraints and other economically important factors on SME failure", *International Review of Entrepreneurship*, 16(3): 289-328.

Daunfeldt, S., Halvarsson, D., & Mihaescu, O. (2016), "High-growth firms: not so vital after all?", *International Review of Entrepreneurship*, 14(4): 377-394.

Davidsson, P. (1989), *Continued Entrepreneurship and Small Firm Growth*, Stockholm: Stockholm School of Economics.

Davidsson, P. (1991), "Continued entrepreneurship: ability, need, and opportunity as determinants of small firm growth", *Journal of Business Venturing*, 6: 405-429.

Davidsson, P., & Wiklund, J. (2000), "Conceptual and empirical challenges in the study of firm growth", In D. Sexton, & H. Landström (Eds.), *The Blackwell Handbook of Entrepreneurship*: Oxford: Blackwell Business, pp. 26-44.

Davidsson, P., & Henrekson, M. (2002), "Institutional determinants of the prevalence of start-ups and high-growth firms: evidence from Sweden", *Small Business Economics*, 19(2): 81-104.

Davidsson, P., Delmar, F., & Wiklund, J. (2006), *Entrepreneurship and the growth of firms*. Northampton, MA: Edward Elgar.

Delmar, F. (1996), *Entrepreneurial behavior and business performance*, Stockholm School of Economics, Stockholm.

Delmar, F. (1997), "Measuring growth: Methodological considerations and empirical results", In: P. D. Reynolds, W. D. Bygrave, S. Manigart, C. Mason, G. D. Meyer, H. J. Sapienza, & K. G. Shaver (Eds.), *Frontiers of Entrepreneurship Research 1999*, Vol. 19: 90-104. Wellesley, MA: Babson College.

Delmar, F., & Davidsson, P. (2006), "Firm size expectations of nascent entrepreneurs", In: P. Davidsson, F. Delmar and J. Wiklund (Eds.), *Entrepreneurship and the growth of firms*, Cheltenham, UK: Edward Elgar, pp. 87-108.

Delmar, F., Davidsson, P., & Gartner, W. (2003), "Arriving at the high-growth firm", *Journal of Business Venturing*, 18(2): 189-216.

Delmar, F., & Shane, S. (2006), "Does experience matter? The effect of founding team experience on the survival and sales of newly founded ventures", *Strategic Organization*, 4(3): 215-247.

DeNeve, K. M., & Cooper, H. (1998), "The happy personality: a meta-analysis of 137 personality traits and subjective well-being", *Psychology Bull*, 124(8): 197-229.

Dennis, W. J., & Solomon, G. (2001), "Changes in intention to grow over time", *Babson/Kauffman Foundation Entrepreneurship Research Conference*, Jönköping, Sweden.

Dess, G. G., & Beard, D. W. (1984), "Dimensions of organizational task environments", *Administrative Science Quarterly*, 29: 52-73.

De Vita, L., Mari, M., & Poggesi, S. (2014), "Women entrepreneurs in and from developing countries: Evidences from the literature", *European Management Journal*, 32: 451-460.

Dewar, R. D., Whetten, D. A., & Boje, D. (1980), "An examination of the reliability and validity of the Aiken and Hage scales of centralization, formalization and task routineness", *Administrative Science Quarterly*, 25: 120-128.

Dimitratos, P., Buck, T., Fletcher, M., & Li, M. (2016), "The motivation of international entrepreneurship: The case of Chinese transnational entrepreneurs", *International Business Review*, 25(5): 1103-1113.

Dollinger, M. J. (1999), *Entrepreneurship: strategies and resources*, Upper Saddle River, NJ: Prentice Hall.

Dunne, P., & Hughes, A. (1994), "Age, size, growth and survival: UK companies in the 1980s", *Journal of Industrial Economics*, 42(2): 115-140.

DuRietz, A., & Henrekson, M. (2000), "Testing the female underperformance hypothesis", *Small Business Economics*, 14: 1-10.

Ericsson, K., & Smith, J. (1991), "Prospects and limits of the empirical study of expertise: an introduction", in K. Ericsson, & J. Smith (Eds.), *Toward a general theory of expertise: prospects and limits*: 1-38. Cambridge: Cambridge University Press.

Fan, P., (2018), "Debt retirement at IPO and firm growth", *Journal of Economics and Business*, https://doi.org/10.1016/j.jeconbus.2018.08.004.

Felício, J. A., Couto, E., & Caiado, J. (2014), "Human capital social capital and organizational performance", *Management Decision*, 52(2): 350-364.

Fischer, E. M., Reuber, A. R., & Dyke, L. S. (1993), "A theoretical overview of research on sex, gender, and entrepreneurship", *Journal of Business Venturing*, 8: 151-168.

Flamholtz, E. G. (1986), *Managing the transition from an entrepreneurship to a professionally managed firm*, San Francisco, CA: Jossey-Bass.

Flamholtz, E. G., & Brzezinski, D. (2016), "Strategic Organizational Development and Growing Pains: Empirical Evidence from Europe"*, International Review of Entrepreneurship*, 14(1): 51-68.

Fry, F. L. (1993), *Entrepreneurship: a planning approach*, Minneapolis-St. Paul: West Publishing.

Garicano, L., & Hubbard, T. N. (2003), *Specialization and organization in legal services: evidence from market level data*, Chicago, IL: University of Chicago.

Geeraerts, G. (1984), "The effect of ownership on the organization structure in small firms", *Administrative Science Quarterly*, 29: 232-237.

Geroski, P. A., & Gugler, K. (2004), "Corporate growth convergence in Europe", *Oxford Economics Papers*, 56: 597-620.

Gidehag, A., & Lodefalk, M. (2017), "Recruiting for Small Business Growth: Micro-level Evidence", *International Review of Entrepreneurship*, 15(2): 151-174.

Gill, A., & Biger, N. (2012), "Barriers to small business growth in Canada", *Journal of Small Business and Enterprise Development*, 19(4): 656-668.

Glancey, K. (1998), "Determinants of growth and profitability in small entrepreneurial firms", *International Journal of Entrepreneurial Behavior and Research*, 4(1): 18-27.

Goddard, J., Wilson, J., & Blandon, P. (2002), "Panel tests of Gibrats law for Japanese manufacturing", *International Journal of Industrial Organization*, 20(3): 415-433.

Grant, R. M. (1991), "The resource-based theory of competitive advantage: Implications for strategy formulation", *California Management Review*, 33: 114-135.

Grillitsch, M., Schubert, T., & Srholec, M. (2018), "Knowledge base combinations and firm growth", *Research Policy*, https://doi.org/10/1016/j.respol.2018.08.009

Hakkert, R., & Kemp, R. G. M. (2006), "An ambition to grow: a multidisciplinary perspective on the antecedents of growth ambitions", EIM Research Report*,* no. H200603. Zoetermeer: EIM.

Hall, R. H., Haas, J. E., & Johnson, N. J. (1967), "Organizational size, complexity and formalization", *American Sociological Review*, 32(December): 903-911.

Hallak, R., Assaker, G., O'Connor, P., & Lee, C. (2018), "Firm performance in the upscale restaurant sector: The effects of resilience, creative self-efficacy, innovation and industry experience", *Journal of Retailing and Consumer Services*, 40: 229-240.

Haltiwanger, J., Jarmin, R. S., & Miranda, J. (2013), "Who Creates Jobs? Small versus Large versus Young", *The Review of Economics and Statistics*, 95(2), 347-361.

Hanssen-Bauer, J., & Snow, C. C. (1996), "Responding to hypercompetition: The structure and processes of regional learning network organizations", *Organization Science*, 7: 413-427.

Hardwick, P., & Adams, M. (2002), "Firm size and growth in the United Kingdom life insurance industry", *The Journal of Risk and Insurance*, 69(4): 577-593.

Hart, O., & Moore, J. (2005), "On the design of hierarchies: coordination versus specialization"*: Journal of Political Economy*, 113(4): 675-702.

Heskel, J. (1999), "Small firms, contracting-out, computers and wage inequality: evidence from UK Manufacturing", *Economica*, 66(261): 1-21.

Houston, F. S. (1986), "The marketing concept: what it is and what it is not", *Journal of Marketing*, 50(2): 81-87.

Huber, P., Oberhofer, H., & Pfaffermayr, M. (2017), "Who creates jobs? Econometric modeling and evidence for Austrian firm level data", *European Economic Review*, 91: 57-71.

Hult, G. T. M., Snow, C. C., & Kandemir, D. (2003), "The role of entrepreneurship in building cultural competitiveness in different organizational types", *Journal of Management*, 29(3): 401-426.

Human, S. E., & Matthews, C. H. (2004), "Future expectations for the new business", in W. B. Gartner, K. G. Shaver, N. M. Carter, & P. D. Reynolds (Eds.), *Handbook of Entrepreneurial Dynamics: the Process of Business Creation*: 94-103. Thousand Oaks, CA: Sage.

Hurtz, G. M., & Donovan, J. J. (2000), "Personality and job performance: the big five revisited", *Journal of Applied Psychology*, 85(6): 869-879.

Ibhagui, O. W., & Olokoyo, F. O. (2018), "Leverage and firm performance: new evidence on the role of firm size", *North American Journal of Economics and Finance*, 45: 57-82.

Ibeh, N. (2003), "Toward a contingency framework of export entrepreneurship: conceptualizations and empirical evidence", *Small Business Economics*, 20(1): 49-68.

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

Jensen, M. C., & Meckling, W. H. (1992), "Specific and general knowledge, and organizational structure". In L. Werin, & H. Wijkander (Eds.), *Contract economics*: 251-274. Oxford: Blackwell Publishers.

Johnson, B. (1990), "Toward a multidimensional model of entrepreneurship: the case of achievement motivation and the entrepreneur", *Entrepreneurship Theory and Practice*, 14(3): 39-54.

Johnson, P. (1986), *New firms: an economic perspective*, London: Allen and Unwin.

Judge, T. A., Higgins, C. A., Thoresen, C. J., & Barrick, M. R. (1999), "The big five personality traits, general mental ability, and career success across the life span", *Personnel Psychology*, 52(3): 621-653.

Klepper, S. (2001), "Employee startups in high-tech industries", *Industrial and Corporate Change*, 10(3): 639-674.

Kogan, N., & Wallach, M. A. (1964), *Risk taking*, New York: Holt, Rinehart, and Winston.

Kohli, A.K. & Jaworski, B.J. (1990), "Market Orientation: The Construct, Research Propositions, and Managerial Implications", *Journal of Marketing* 54(2): 1-18.

Kolvereid, L. (1992), "Growth aspirations among Norwegian entrepreneurs", *Journal of Business Venturing*, 7: 209-222.

Lawless, M. (2014), "Age or size? Contributions to job creation", *Small Business Economics*, 42(4), 815-830.

Lau, C., & Busenitz, L. W. (2001), "Growth intentions of entrepreneurs in a transitional economy: The People's Republic of China", *Entrepreneurship Theory and Practice*, 26(1): 5-20.

Litzinger, W. (1961), "The motel entrepreneur and the motel manager", *Academy of Management Journal*, 8: 268-281.

Liu, J., Tsou, M., & Hammitt, J. (1999), "Do small plants grow faster? Evidence from the Taiwan electronics industry", *Economics Letters*, 65(1): 121-129.

Locke, E. A., & Latham, G. P. (1990), *A theory of goal setting and task performance*, Englewood Cliffs, NJ: Prentice Hall.

Lockett, A., Wiklund, J., Davidsson, P., & Girma, S. (2011), "Organic and acquisitive growth: Reexamining, testing and extending Penrose's growth theory", *Journal of Management Studies*, 48(1): 48-74.

Low, M. B., & Macmillan, I. C. (1988), "Entrepreneurship: past research and future challenges", *Journal of Management*, 14: 139-151.

Lumpkin, G. T., & Dess, G. G. (1996), "Clarifying the entrepreneurial orientation construct and linking it to performance", *Academy of Management Review*, 21: 135-172.

Lumpkin, G. T., & Dess, G. G. (2001), "Linking two dimensions of entrepreneurial orientation to firm performance: the moderating role of environment and industry life cycle", *Journal of Business Venturing*, 16: 429-451.

Madsen, E. L. (2007), "The significance of sustained entrepreneurial orientation on performance of firms-a longitudinal analysis", *Entrepreneurship and Regional Development*, 19: 185-204.

Martens, C. D. P., Machado, F. J., Martens, M. L., de Oliveira e Silva, F. Q. P., & de Freitas, H. M. R. (2018), "Linking entrepreneurial orientation to project success", *International Journal of Project Management*, 36: 255-266.

McClelland, D. C. (1965), "N-achievement and entrepreneurship: a longitudinal study", *Journal of Personality and Social Psychology*, 1: 389-392.
McPherson, M. A. (1996), "Growth of micro and small enterprise in Southern Africa", *Journal of Development Economics*, 48: 253-277.
Meijaard, J. Mosselman, M., Frederiks, K.F., & Brand, M.J. (2002), "Organisatietypen in het MKB: Een verkennend onderzoek naar de organisatiestructuren van het midden- en kleinbedrijf", Strategische Verkenning, no. B200105. Zoetermeer: EIM.
Meijaard, J., Brand, M. J., & Mosselman, M. (2005), "Organizational structure and performance in Dutch small firms", *Small Business Economics*, 25(1): 83-96.
Miller, D. (1983), "The correlates of entrepreneurship in three types of firms", *Management Science*, 29: 770-791.
Mintzberg, H. (1979), *The structuring of organizations*, Englewood Cliffs, NJ: Prentice Hall.
Morrison, A., Breen, J., & Ali, S. (2003), "Small business growth. Intention, ability and opportunity", *Journal of Small Business Management*, 41(4): 417-425.
Nandram, S. S., & Samsom, K. J. (2000), "Succesvol ondernemen: eerder een kwestie van karakter dan van kennis [Successful entrepreneurship; more a matter of character than knowledge]", Report by Nyenrode Center for Entrepreneurship. Breukelen, Netherlands: Universiteit Nyenrode.
Narver, J. C., & Slater, S. F. (1990), "The effect of a market orientation on business profitability", *Journal of Marketing*, 54: 20-35.
Nelson, R. R., & Winter, S. G. (1982), *An evolutionary theory of economic change*, Cambridge, MA: Belknap Press of Harvard University Press.
Nicholson, N. (1998), "Personality and entrepreneurial leadership: a study of the heads of the UK's most successful independent companies", *European Management Journal*, 16(5): 529-539.
Nickell, S. (1996), "Competition and corporate performance", *Journal of Political Economy*, 104: 724-746.
Nickell, S., Nicolitsas, D., & Dryden, N. (1997), "What makes firms perform well?", *European Economic Review*, 41(3-5): 783-796.
Nunnally, J. (1967). *Psychometric theory*. New York, McGraw Hill.
Orser, B. J., Hogarth-Scott, S., & Wright, P. (1998), "On the growth of small enerprise: the role of intentions, gender and experience", In: *Frontiers of Entrepreneurship Research*: 366-380. Wellesley, MA: Babson College.
Palich, L. E., & Bagby, D. R. (1995), "Using cognitive theory to explain entrepreneurial risk-taking: challenging conventional wisdom", *Journal of Business Venturing*, 10(6): 425-438.
Pearce, J. M. (2018), "Ensuring technical competency for management of research-focused organizations", *The Journal of High Technology Management Research*, https://doi.org/10.1016/j.hitech.2018.09.002.
Pelham, A. M., & Wilson, D. T. (1996), "A longitudinal study of the impact of market structure, firm structure, strategy, and market orientation culture on dimensions of small firm performance", *Journal of the Academy of Marketing Science*, 24: 27-43.
Pinger, P., Schäfer, S., Schumacher, H. (2018), "Locus of control and consistent investment choices", *Journal of Behavioral and Experimental Economics*, 75: 66-75.
Pissarides, F. (1999), "Is lack of funds the main obstacle to growth? The EBRD's experience with small and medium-sized businesses in central and eastern Europe", *Journal of Business Venturing,* 14(5-6):519-539.
Pugh, D. S., & Hickson, D. J. (1976), *Organizational structure in its context*, Farnborough Hants: Saxon House.
Rauch, A., Frese, M., & Utsch, A. (2005), "Effects of Human Capital and Long-Term Human Resources Development and Utilization on Employment Growth of Small-Scale Businesses: A Causal Analysis", *Entrepreneurship Theory and Practice*, 29(6): 681-698
Reichstein, T., & Dahl, M. (2004), "Are firm growth rates random? analysing patterns and dependencies", *International Review of Applied Economics*, 18(2): 225-246.
Riding, A. L., & Haines, G. J. (1998), "Defaulting on loan guarantees: costs and benefits of encouraging early-stage growth", in R. P. D. Bygrave, W. D. Bygrave, N. M. Carter, S. Manigart, G. D. Meyer, & K. G. Shaver (Eds.), *Frontiers of Entrepreneurship Research*: 504-518. Wellesley, MA: Babson College.

Ripsas, S. (1998), "Towards an interdisciplinary theory of enterpreneurship", *Small Business Economics*, 10: 103-115.

Robbins, S. P. (1990), *Organizational theory: structure, design and applications* (3rd ed.), Englewood Cliffs: Prentice Hall.

Robson, P., & Bennett, R. (2000), "SME growth: the relationship with business advice and external collaboration", *Small Business Economics*, 15(3): 193-208.

Rotter, J. B. (1966), "Generalized expectancies for internal versus external control of reinforcement", *Psychological Monographs*, 80(1): 1-28.

Sapienza, H. J., & Grimm, C. M. (1997), "Founder characteristics, start-up process, and strategy/ structure variables as predictors of shortline railroad performance", *Entrepreneurship Theory and Practice*, 22(1): 5-24.

Sarasvathy, D. K., Simon, H. A., & Lave, L. (1998), "Perceiving and managing business risks: differences between entrepreneurs and bankers", *Journal of Economic Behaviour and Organization*, 33(2): 207-225.

Sexton, D., & Bowman-Upton, N. (1991), *Entrepreneurship: creativity and growth*, New York: Macmillan.

Shane, S., Locke, E., & Collins, C. J. (2003), "Entrepreneurial motivation", *Human Resource Management Review*, 13(2): 257-280.

Shepherd, D. A., Douglas, E., & Shanley, M. (2000), "New venture survival: ignorance, external shocks and risk reduction strategies", *Journal of Business Venturing*, 15: 393-410.

Shepherd, D. A., & Wiklund, J. (2009), "Are we comparing apples with apples or apples with oranges? appropriateness of knowledge accumulation accross grwoth studies", *Entrepreneurship Theory and Practice*, 33(1):105-123.

Siepel, J., Cowling, M., & Coad, A. (2017), "Non-founder human capital and the long-run growth and survival of high-tech ventures", *Technovation*, 59: 34-43.

South, S. C., Jarnecke, A. M., & Vize, C. E. (2018), "Sex differences in the big five model personality traits: A behavior genetics exploration", *Journal of Research in Personality*, 74: 158-165.

Staniewski, M. W., Janowski, K., & Awruk, K. (2016), "Entrepreneurial personality dispositions and selected indicators of company functioning", *Journal of Business Research*, 69: 1939-1943.

Stevenson, H. H. (1983), "A perspective on entrepreneurship", Harvard Business School Working Paper, 9-384- 131.

Stevenson, H. H., & Gumpert, D. (1985), "The heart of entrepreneurship", *Harvard Business Review*, 85: 85- 94.

Stevenson, H. H., & Jarillo, J.C. (1986), "Preserving entrepreneurship as companies grow", *Journal of Business Strategy*, 6:10-23.

Stevenson, H. H., & Jarillo, J.C. (1990), "A paradigm of entrepreneurship: Entrepreneurial management", *Strategic Management Journal*, 11:17-27.

Stiglitz, J. E., & Weiss, A. (1981), "Credit rationing in markets with imperfect information", *American Economic Review*, 71(3): 393-410.

Storey, D. J. (1994), *Understanding the small business sector*, London: Routledge.

Thorelli, H. B. (1987), "Entrepreneurship in international marketing: some research opportunities", in G. E. Hills (Ed.), *Research at the Marketing/Entrepreneurship Interface* 183-204. Marietta, GA: USASBE.

Venkataraman, S. (1997), "The distinctive domain of entrepreneurship research: An editor's perspective", In J. Katz, & R. Brockhaus (Eds.), *Advances in entrepreneurship, firm emergence, and growth*, 3: 119-138. Greenwich, CT: JAI Press.

Verheul, I. (2018), "Commitment or control? HRM practices in female and male-led small business", *International Review of Entrepreneurship*, 16(3): 329-354.

Vinchur, A. J., Schippmann, J. S., Switzer, F. S. I., & Roth, P. L. (1998), "A meta-analytic review of predictors of job performance for salespeople", *Journal of Applied Psychology*, 83: 586-597.

Welsh, D. H. B., Kaciak, E., & Shamah, R. (2018), "Determinants of women entrepreneurs' firm performance in a hostile environment", *Journal of Business Research*, 88: 481-491.

Welter, F. (2001), "Who wants to grow? Growth intentions and growth profiles of (nascent) entrepreneurs in Germany", In: *Frontiers of Entreprenurship Research*: 91-147. Wellesley, MA: Babson College.
Wiklund, J. (1998), *Small Firm Growth and Performance: Entrepreneurship and Beyond*, Jönköping: Jönköping International Business School.
Wiklund, J., & Shepherd, D. A. (2003), "Aspiring for, and achieving growth: the moderating role of resources and opportunities", *Journal of Management Studies*, 40(8): 1911-1941.
Wiklund, J., & Shepherd, D. A. (2005), "Entrepreneurial orientation and small business performance: a configurational approach", *Journal of Business Venturing*, 20(1): 71-91.
Wiklund, J., Patzelt, H., & Shepherd, D. A. (2009), "Building an integrative model of small business growth", *Small Business Economics*, 32(4): 351-374.
Yayla, S., Yeniyurt, S., Uslay, C., & Cavusgil, E. (2018), "The role of market orientation, relational capital, and internationalization speed in foreign market exit and re-entry decisions under turbulent conditions", *International Business Review*, 27: 1105-1115.
Yasuda, T. (2005), "Firm growth, size, age and behaviour in Japanese manufacturing", *Small Business Economics*, 24(1): 1-15.
Zahra, S. A. (1991), "Predictors and financial outcomes of corporate entrepreneurship: An explorative study", *Journal of Business Venturing*, 6: 259-285.
Zahra, S. A., & Covin, J. G. (1995), "Contextual influences on the corporate entrepreneurship-performance relationship: a longitudinal analysis", *Journal of Business Venturing*, 10(1): 43-58.

Appendix A. Definitions of regression variables in the conceptual approach

Regression variables	Questions in the questionnaire
INDIVIDUAL DIMENSION	
Need for achievement (3 items, α=.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
Risk taking propensity (3 items, α=.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	- The result of my business is strongly dependent on my own effort
Sociability	- After working time I often meet professionally relevant persons (customer, advisor, etc)
Extraversion	- Talking to strangers is easy for me
Self-efficacy (8 items, α=.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

Experience (4 items, α=.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? - Did you have entrepreneurial experience before you came to work in this business?
Specific skills	- Technical education (1=yes, 0=no)
Managerial skills	- Management/economics education (1=yes, 0=no)
Individual age	- What is your birth year? (difference between survey year and birth year)
Gender	- What is your gender? (1=male, 0=female)
Education	- What is the highest degree you obtained? (1=tertiary education including higher vocational education, 0=otherwise)
Growth motivation	- If your business can develop as you expect in the coming years, what do you expect to be the increase of employment in 2007? (number of employees)
ORGANIZATIONAL DIMENSION	
Firm age	- In which year did you start your business? (difference between survey year and establishment year)
Firm size	- How many full-time employees do you currently have in your business (i.e., in 2005)? (normalized number of employees)
Centralization	- Most decisions have to be made by managers
Standardization	- The intended result of the work is specified in advance
Formalization	- Working procedure are written down
Specialisation (tasks)	- Every employee performs some specific tasks
Specialisation (skills)	- Employees have functions which only they can fulfill
Departmentalization	- How many management levels do you have within your business?
Market orientation (8 items, α=.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 - The management team often discusses the strong point of competitors - We often share information about client wishes internally. - All our internal procedures and rules are focused on fulfilling the needs in the market. - We are always busy with customer needs that will emerge after some years. - We focus on acquiring new customers with new needs.
Entrepreneurial orientation (5 items, α=.78)	- We search actively for innovative product/service concepts and new production processes. - We undertake actions to which other companies must react - Our slogan is “defeating our competitors” - Compared to other business, we take a lot of risk - We react strongly and offensively to the actions of competitors
Growth orientation (3 items, α=.74)	- We are prepared for a strong growth of our business. - With the current organization structure and business resources, we can easily grow with 20% - Within our company, everyone knows that we want to grow fast.

Organizational learning (6 items, α=.81)	- Everyone here agrees with the common goal - We have a strong team feeling - Employees' training is an investment, it's not a cost - Learning is according to us the key to make things better - We make enough free time to learn from the mistakes we made - We study the successful and unsuccessful business activities and discuss with each other about it
Past financial performance (3 items, α=.70)	- How would you describe the profitability of your company on average in the last five years? (1=extremely loss-making to 7=extremely profit-making) - How did turnover develop in the last five years? (1=strongly decrease to 7=strongly grow) - How do you judge your financial performance compared to important competitors in your sector? (1=very bad to 7=very good)
Extra finance	- Do you think that you need extra finance in the coming 2 years? (1=yes, 0=no)
Financial bottleneck	- Do you experience bottlenecks in the financing of your business? (1=yes, 0=no)
Human resource development	- How many training hours have your employees had in the last 2 years?
ENVIRONMENTAL DIMENSION	
Competitive intensity (2 items, α=.87)	- Our maket share is threatened by intensive competition - Our market is characterized by strong competition.
Market Dynamism (2 items, α=.71)	- Customers constantly look for new products and services - Products and services become old very fast in our market
Technology turbulence	- In our market, you must often update technology in order to stay in the market.
Munificence (3 items, α=.69)	- There is uncultivated market potential in our market - To which degree are there profit and growth opportunities in your market? - Our most important market grows fast
Uncertainty Heterogeneity	- Questions and preferences of customers are unpredictable - Customers differ strongly in buying behaviour
GROWTH BARRIERS	
Growth barriers (17 items, α=.90)	- Attract and keep qualified personnel - Getting cash flow - Access to new markets - Keep up with technological development - Difficulties with inventory and suppliers - Increase management workload - Find right advices - Get right knowledge/suitable technology - Degree of competitiveness - Development of market volume - Set up suitable organization structure - Get access to relations and relevant networks - Lack of support from banks - Difficult to obtain capital - Find a right (production/sales) location - Legalization - Lack of support from government
CONTROLS	

Merge experience	- Did your company merge with others in the past 2 years?
Division structure Hierarchy structure Function 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)
Manufacturing Construction Trade Transport & communication	- Which sector does your business belong to? Manufacture, construct, trade, transport & communication or services. (Sector dummies, using services as reference group)
New market Growth market Shrink market	- Which market does your business engage in? New market, growth market, mature market or shrink market. (Dummies, using mature market as reference group)

Notes: 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 > 0.65 are included in the regression analysis. Unless stated otherwise, questions are answered on a 1-7 Likert scale varying from 1 'not at all applicable' to 7 'totally applicable'.

Appendix B. Definitions of regression variables in the statistical approach

Variables	Definition
INDIVIDUAL DIMENSION	
Industrial experience (3 items, α=.85)	Three questions from the factor of experience in the conceptual approach - 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?
Entrepreneurial experience	One question from the factor of experience in the conceptual approach - Did you have entrepreneurial experience before you came to work in this business?
ORGANIZATIONAL DIMENSION	
Market orientation_S (9 items, α=.85)	Questions from the factor of market orientation in the conceptual approach plus the following one: - We are well known for our product/service introduction
Entrepreneurial-growth orientation_S (8 items, α=.84)	Combination of the factor entrepreneurial orientation and the factor growth orientation in the conceptual approach
Organizational learning_S (4 items, α=.80)	Four questions from the factor of organizational learning in the conceptual approach - Employees' training is an investment, it's not a cost - Learning is according to us the key to make things better - We make enough free time to learn from the mistakes we made - We study the successful and unsuccessful business activities and discuss with each other about it
ENVIRONMENTAL DIMENSION	
Dynamism and complexity (5 items, α=.77)	Combination of the factor market dynamism, and the variables technology turbulence, uncertainty and heterogeneity in the conceptual approach
GROWTH BARRIERS	

Non-institutional/financial barriers (12 items, α=.89)	Twelve questions from the factor of growth barriers in the conceptual approach - Attract and keep qualified personnel - Getting cash flow - Access to new markets - Keep up with technological development - Difficulties with inventory and suppliers - Increase management workload - Find right advices - Get right knowledge/suitable technology - Degree of competitiveness - Development of market volume - Set up suitable organization structure - Get access to relations and relevant networks
Institutional barriers (3 items, α=.66)	Three questions from the factor of growth barriers in the conceptual approach - Find a right (production/sales) location - Legalization - Lack of support from government
Financial barriers (4 items, α=.68)	Two questions from the factor growth barriers, combined with the variables extra finance and financial bottleneck in the conceptual approach - Lack of support from banks - Difficult to obtain the capital - Do you think that you need extra finance in the coming 2 years - Do you experience bottlenecks in the financing of your business?

Notes: 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 > 0.65 are included in the regression analysis. Unless stated otherwise, questions are answered on a 1-7 Likert scale varying from 1 ‘not at all applicable’ to 7 ‘totally applicable’.