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Dice thrown from the beginning? An empirical investigation of determinants of firm level growth expectations

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DICE THROWN FROM THE BEGINNING? AN EMPIRICAL INVESTIGATION OF DETERMINANTS OF FIRM LEVEL GROWTH EXPECTATIONS

¿ARRIESGADOS DESDE EL PRINCIPIO?

UNA INVESTIGACIÓN EMPÍRICA DE LOS FACTORES

DETERMINANTES EN LA EXPECTATIVAS DE CRECIMIENTO

DE LAS EMPRESAS

SIRI TERJESEN*

LÁSZLÓ SZERB**, ***

Abstract

This study investigates three competing but complementary perspectives on factors related to entrepreneurial firm growth. We examine individual (entrepreneur) firm and national environment factors associated with the growth expectations of nascent, baby and established firms. Using 25,384 data points from Global Entrepreneurship Monitor (GEM)'s survey of entrepreneurial activity in 35 countries, we find male gender, personal acquaintance with an entrepreneur, innovative product/service, low levels of competition and based in less-developed countries are associated with high growth expectations for all three business stages. Nascent and baby firms' business growth expectations are also linked to having higher levels of start-up capital and outside investment. In contrast to some previous research, we find that a firm's initial size is the best predictor of growth expectations. Altogether, size-related factors determine not only initial growth expectations, but also growth expectations at later firm stages. The law of disproportionate growth (i.e. a small number of firms are responsible for most expected job creation) holds for both start-ups and established businesses, although the latter are more rare. While both start-up and established firm growth expectations are higher in the developing countries, the fastest growing young firms are mainly found in developed countries.

Key words: *Entrepreneurship, firm growth expectations, develop vs. developing countries.*

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Resumen

Este estudio investiga tres perspectivas complementarias sobre los factores relacionados con el crecimiento de negocios emprendedores. Se examinan los factores individuales, de la empresa y de medio ambiente nacional asociados con las expectativas de crecimiento de las empresas nacientes, de reciente creación y establecidas. Usando 25,384 datos del Global Entrepreneurship Monitor (GEM) en 35 países, encontramos que los hombres, la red personal del emprendedor, la innovación del producto o servicio, menor competencia y estar en países menos desarrollados se asocian con expectativas de alto crecimiento para las tres etapas. Para los emprendedores nacientes y de reciente creación las expectativas de crecimiento también están vinculadas a tener mayores niveles de capital inicial e inversión. En contraste con algunas investigaciones previas, encontramos que el tamaño inicial de la empresa es el mejor predictor de las expectativas de crecimiento. En total, los factores relacionados con el tamaño determinan no sólo las expectativas de crecimiento iniciales, sino también las expectativas de crecimiento en etapas posteriores de la empresa. El desproporcionado crecimiento (es decir, un pequeño número de empresas son responsables de la mayoría de la creación de empleo) se da tanto en empresas nuevas como en establecidas, aunque estas últimas son más escasas. Si bien, tanto la puesta en marcha y las expectativas de crecimiento son mayores en los países en desarrollo, los emprendimientos de más rápido crecimiento se encuentran principalmente en los países desarrollados.

Palabras clave: *Emprendimiento, expectativas de crecimiento de la empresa, países desarrollados vs. en desarrollo.*

JEL Classification: *L25, L26, O57.*

INTRODUCTION

The economic performance of a firm or of a geographic region is often measured by growth rates and is of central interest to a variety of stakeholders (Romer, 1990; Penrose, 1959; Solow, 1956; Lucas, 1988). Growth is “the very essence of entrepreneurship” (Sexton, 1997, p. 97) and an important criteria distinguishing entrepreneurial and non-entrepreneurial firms (Birch, 1987).¹ Firm growth rates vary greatly and only a small percentage of firms grow at rates higher than their country’s gross domestic product (GDP). Furthermore, only a fraction of firms, approximately 1-4%, are responsible for new job creation (Autio, 2007). The majority of new firms are started in mature industries with local markets and with imitative business practices (Aldrich, 1999; Reynolds, Bygrave and Autio, 2003).

¹ By entrepreneurship, we mean the creation or emergence of a new organization (Gartner, 1988).

Extant research identifies several drivers of firm growth, including the characteristics of the individual entrepreneur (e.g. entrepreneurial skills, risk taking, opportunity recognition, managerial knowledge) (Chell and Baines, 1998; Knight, 1990; Kirzner, 1979; Storey, 1994; Wennekers and Thurik, 1999), the firm (e.g. age, size, strategy, product/process innovation, financing) (Acs, 1996; Baumol, 2002; Reid, 1993; Roper, 1997) and the regional and national environment (e.g. economic development) (Solow, 1956; Romer, 1990), however the connection across micro, meso and macro level forces is unclear. Furthermore, while it is well known that small and young firms grow faster than their more established counterparts (Davidsson, 2000; Evans, 1987a; Evans, 1987b; Storey, 1994), we lack an understanding of which factors explain growth differentials across firm age and size.

Extant growth research pursues four lines of inquiry: (1) assessing internal and external determinants that foster or hinder organizational growth, (2) managing for growth, (3) assessing the effects of growth, and (3) managing the effects of growth (Davidsson *et al.*, 2006). The present study complements this research by examining factors associated with growth at three distinct firm stages. Specifically the present study explores: “What individual, firm and national environment factors influence the growth expectations of nascent (0-3 months old), baby (3-42 months old) and established (over 42 months old) firms?”² By growth, we refer to the growth expectations in number of employees.³ We use pooled data from the Global Entrepreneurship Monitor (GEM) of 25,384 firms from 38 countries for 2003 and 2004. Our sample includes 5,588 nascent, 6,929 baby and 13,524 established firms.

We are aware of only one researcher using GEM data to examine growth expectations. Autio (2005, 2007) reports that only a small portion of new businesses are responsible for most new job creation. These “gazelle” growth-oriented firms are established by highly educated individuals with high household income and opportunity motivations. We follow Autio (2005, 2007) in using the expected number of jobs as a measure of business growth and extend his study in two meaningful ways: First, we augment Autio’s (2005, 2007) focus on individual characteristics to include firm demographics and strategy and the national environment. Second, we build on Autio’s (2005, 2007) early stage firm examinations by incorporating established firms.

² We use GEM standard definitions for nascent, baby and established firms. By ‘nascent’, we refer to firms that are in the process of starting up, e.g. an individual has, during the past 12 months, taken tangible action to start a new business, would personally own all or part of the new firm, would actively participate in the day-to-day management of the firm and has not yet paid salaries for more than three months. ‘Baby’ describes those firms which are no more than 42 months old and are started by an individual who is currently actively managing the firm and personally owns all or part of it. ‘Established’ firms are more than 42 months old and actively managed by an adult who is a full or part owner. By ‘start-ups’, we refer to early stage firms, e.g. both nascent and baby firms.

³ As Penrose (1959, p. 199) noted, “there is no way of measuring an amount of expansion, or even the size of the firm, that is not open to serious conceptual objections.” There are other suitable measures of growth such as sales, assets, physical output, market share and profits, however these data are not available in Global Entrepreneurship Monitor.

This study makes three novel contributions. First, we add to existing literature by comparing the relative importance of factors for firms at three distinct levels of development. Second, as Gibrat's (1931) 'random walk' theory of growth⁴ based on firm size has been rejected by empirical research (e.g. Jovanovic, 1982; Evans, 1987a, 1987b), we aim to answer the more relevant question: are a large number of mainly small firms or a tiny proportion of gazelle firms responsible for growth? (Autio, 2005, 2007; Delmar *et al.*, 2003), and at what stages? Third, we explore entrepreneurial firm growth expectations in countries with varying levels of economic development.

THEORETICAL BACKGROUND AND HYPOTHESES

Scholars have long pursued explanations of firm growth and size determinants and differences. According to You (1995), the literature can be classified into four approaches. Traditional micro-theories of the production function focus on technical and allocational efficiency (Viner, 1931; Lucas, 1978). A modern version of this approach emphasizes the importance of distinctive resources (e.g. Penrose, 1959; Peng and Heath, 1996; Barney, 1991), is limited in its ability to explain firms' unique growth trajectories.

The transaction cost theory builds on the nature of resources under the conditions of trade-off between internal (bureaucratic) organizational costs and external costs of contract and moral hazard. The more unique the resource, the more difficult it is to purchase in the market (Williamson, 1995). The relative scarcity of human resources for young firms may explain higher growth rates when compared to more mature businesses. In this sense transaction cost theory closely resembles an amended version of the micro-economic theories.

Industrial organization scholars explain firm size and distribution within the framework of the structure-conduct-performance (SPC) paradigm (e.g. Schmallense, 1989). According to Bain (1956), market power (measured by the number of buyers and sellers) and entry barriers influence firm strategy and performance. Industries characterized by high entry barriers can prevent new entry, maintaining the monopoly positions of a few large firms. The Chicago school reverses the causality link, claiming that firms with superior performance and strategy can reach monopoly power (Scherer, 1980). To date, empirical studies neither reject nor reinforce fully the causality between strategy (conduct) and dominant market structure (firm size).

Finally, we should mention the popular life-cycle models that stylize the evolution of an individual firm in a particular industry. From birth through start-up, growth, and maturity until revival or death, businesses evolve (Mueller, 1972). In each phase, firms face particular challenges and are characterized by specific organizational setup, financial structure, strategies, and management. In the early phases of development of a new industry, alternative technologies and product compete with one another. After the initial high entry and

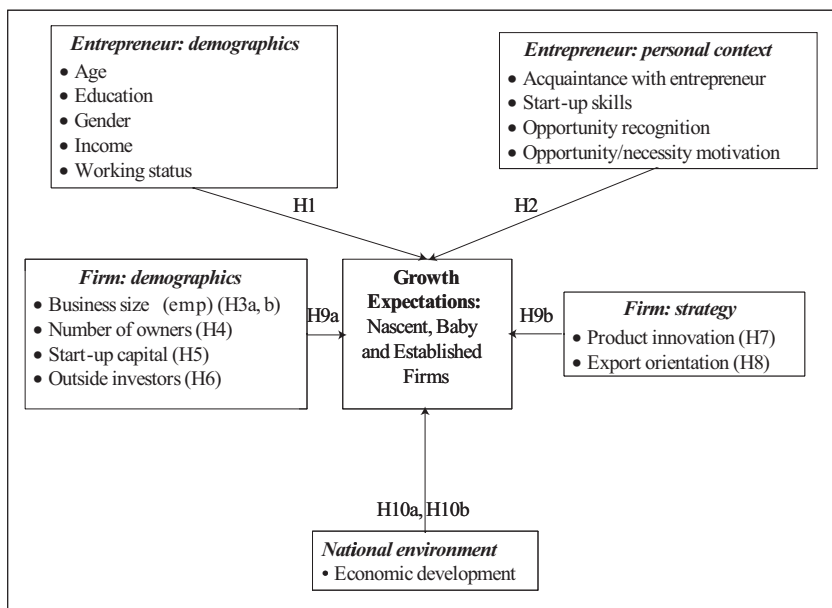
⁴ Gibrat's (1931) random growth theory describes how firm growth is independent of size and age. According to Gibrat's law, firm growth rates are randomly distributed by size and age.

exit rates, a dominant design emerges and market shares stabilize (Klepper, 1996). While smaller sized firms dominate in the beginning, larger businesses are often found in mature industries (Acs and Audretsch, 1987). Life cycle models do not follow Gibrat’s law of disproportionate growth (Gibrat, 1931) which states that firms grow at an increasing rate and in the later phase of development grow at a decreasing rate, implying that small firms grow larger than large firms. However, high failure rates are more prevalent in the early phases (Agarwal and Audretsch, 2001).

While the theoretical fundamental of research is important, our approach is empirical. We rely on a conceptual model that allows us to deviate from the strict axioms of mathematic modeling and include the examination of factors outside classical growth models. Moreover, as the examination of small firm related factors is usually excluded from growth models (O’Farrell and Hitchens, 1988), we rely on sociological and psychological approaches to specific individual factors.

Prior conceptual models indicate the importance of considering multi-level factors contributing to firm growth. Storey (1994) analyzes a variety of published studies, finding three partially overlapping categories which are necessary for growth: the entrepreneur and his/her resources available before firm start-up, firm characteristics and firm strategy. The present study investigates five factors: individual entrepreneur demographics and personal context firm demographics and strategy, and national environment. See Figure 1.

FIGURE 1
MODEL OF FIRM GROWTH EXPECTATIONS



Entrepreneur: Individual Demographics

We begin with the starting point of most entrepreneurship research: the entrepreneur who began an enterprise. It is expected that entrepreneurs are leaders and according to upper echelons theory, play a key role in shaping firm outcomes. We are concerned with the role of an entrepreneur's demographics of age, education, gender, employment status and household income. The traditional theories described above do not say anything about the demographic characteristics of the entrepreneur. Among others, Baumol (1968) cautioned against omitting the entrepreneur from an analysis of entrepreneurial activity. Commenting on extant entrepreneurship research he declared, "The theoretical firm is entrepreneurless - the Prince of Denmark has been expunged from the discussion of Hamlet."

Empirical studies provide a mixed picture of the impact of the entrepreneur's age and likelihood of involvement in entrepreneurial activity, with some indicating a curvilinear relationship (e.g. Davidsson, 1998; Reynolds, 1995; Reynolds *et al.*, 2004; Storey, 1994) and others a negative relationship (e.g. Janssen, 2003). The negative impact of age is based on a decline in innovative behavior, increased interest in status quo, and increased risk aversion (Janssen, 2003). Thus, we expect a negative relationship between an entrepreneur's age and his/her expectations of firm growth.

Female entrepreneurs are generally more risk-averse than their male counterparts. However, most gender differences disappear after controlling for individual and business demographic characteristics such as age, education, wealth and business sector (Chell and Baines, 1998; Davidsson *et al.*, 2006; Johnsen and McMahon, 2005; Du Rietz and Henrekson, 2000; Storey, 1994). Therefore we expect a positive effect of male gender on firm growth, however, the influence could be insignificant.

Education qualifications are important in reducing the constraints imposed by lack of personal wealth (Casson, 1982). Higher education degree qualifications open access to employment opportunities. Although traditionally most entrepreneurs possess medium levels of education, an increasing percentage of entrepreneurs hold higher education degrees (Reynolds *et al.*, 2004; Storey, 1994). High growth firm entrepreneurs are, almost exclusively, found among individuals who have a university degree (Autio, 2007). Therefore, we expect a positive relationship between an entrepreneur's education level and his/her expectations for firm growth.

The connection between prior employment and start-up propensity and growth expectations is clear. Expected growth is negatively related to previous unemployment and positively related to employment (Davidsson, 1989; Storey, 1994). Unfortunately we cannot test the effect of previous experience in the same industry on firm growth as examined by Klepper (2001). However, no study examines the connections between present employment and growth expectations. We expect that firms which are managed full-time have a higher potential, as the entrepreneur/owner has a greater incentive and can devote more time to growing the business. Thus, we expect a positive relationship between full-time employment and business growth.

As most entrepreneurs provide a substantial percentage of start-up capital, household income is closely connected to the new firm financing. Many en-

trepreneurs draw financial resources from assets, rather than income, however assets and household income are highly correlated (Maula *et al.*, 2005). Access to personal wealth is a key barrier to entrepreneurial activity and a lack of personal wealth typically restricts the scale of entrepreneurial activity engaged in by the individual (Casson, 1982). Thus, individuals with higher income may be better able to finance the business and to access necessary resources for business growth as lack of finance is a main obstacle of business growth and we expect a positive relationship between an entrepreneur's household income and his/her expectations of firm growth.

Hypothesis 1: *Firm growth expectations are highest among entrepreneurs who are young, highly-educated, male, employed full-time and have high household income.*

Entrepreneur: Individual Demographics & Personal Context

A second consideration at the individual level is an entrepreneur's personal context, e.g. social network, motivation for start-up beliefs about one's skills and the perceived existence of opportunities in the environment. Individuals with entrepreneurial personal context are more likely to start a firm (Davidsson, 2000; Morrison *et al.*, 2003; Reynolds *et al.*, 2004; Storey, 2004). We expect that personal context is also strongly linked to business growth expectations. Knowing another entrepreneur personally could be a sign of deep embeddedness in an entrepreneurial society. We therefore expect a positive relationship between individuals' positive self-assessment of start-up skills and growth expectations.

Individuals who possess start-up and management skills are more likely to be successful (Davidsson, 1989; Janssen, 2003; Morrison *et al.*, 2003; Reynolds *et al.*, 2004; Storey, 1994). We likewise expect a positive relationship between proper managerial skills and growth.

Opportunity recognition and exploitation is a central tenet of entrepreneurship (Autio, 2005; Cassar, 2006; Kirzner, 1979; Morrison *et al.*, 2003; Shane and Ventakamaran, 2000), therefore we expect that entrepreneurs who perceive good opportunities in the environment are more likely to pursue growth.

A large body of literature deals with start-up motivation, finding that opportunity-driven individuals are likely to focus on growing their firms (e.g. Acs *et al.*, 2004; Autio, 2005; Davidsson, 1991; Janssen, 2003; Reynolds *et al.*, 2004; Storey, 1994). In line with previous findings, we expect that compared to necessity-motivated entrepreneurs, opportunity-motivated entrepreneurs will have higher growth expectations for their firms.

Hypothesis 2: *Firm growth expectations are highest among entrepreneurs who are personally acquainted with an entrepreneur, believe they possess the necessary start-up skills, see good start-up opportunities in the environment, and are motivated by opportunity.*

Individual demographics and personal context are important, but it is also critical to consider the characteristics of firms. The resource-based view of organizations explains variations in organizational performance as derived from

firm's resources and capabilities (Barney, 1991; Hitt, Bierman, Shimizu and Kochhar, 2001). We expect a number of firm-level variables impact firm growth expectations, including firm demographics (business size, number of owners/expected owners, innovation), finance (start-up funding required, availability of financial resources other than owners), and task environment (competitive environment, internationalization). Indeed, Wiklund (1998)'s study identified firm strategy as the strongest, most direct driver of firm growth.

Firm: Demographics and Strategy

Gibrat's (1931) seminal contribution outlines a theory of random growth in terms of age and size of the business, however some empirical studies, mainly in the 1970-1980s find the opposite: small firms grow faster than large firms (Jovanovic, 1982; Evans, 1987a, 1987b; Mansfield, 1962; Storey, 1994). Despite these findings, Santarelli *et al.* (2006, p. 43) summary paper concludes "one cannot conclude that the Law is generally valid nor that it is systematically rejected." Furthermore, most studies use relative growth measures and it is unsurprising that firms that start very small will grow fast to achieve a minimum efficient size (Jovanovic, 1982; Evans, 1987b). However, some empirical papers indicate a mixed picture. Contrary to transaction cost and life cycle theories, there is strong evidence that large firms can grow quickly (Glansy, 1998; Storey, 1994) and that initial size is positively correlated with later growth (Wagner, 1995; Davidsson, 1989; Pagano and Schivardi, 2003). As Davidsson (2003), Davidsson *et al.* (2006) and Weinzimmer *et al.* (1998) emphasize, there are different measurement methods (e.g. absolute or relative) and different factors (e.g. sales, employment capital) of growth that can affect the direction of relationship between size and growth. While absolute growth rates favor larger firms, relative growth rate favor smaller firms.⁵ Hence, we expect that the greater the firm size, the greater the growth expectations:

Hypothesis 3: The greater the size of the firm, the greater the firm growth expectations.

Another branch of literature examines the effect of team versus individual effort on entrepreneurial firm growth (Cooper and Daily, 1997; Davidsson *et al.*, 2006; Janssen, 2003; Vesper, 1990), with a common finding that teams outperform solo entrepreneurs (Cooper and Bruno, 1977; Cooper and Gimeno, 1992). Entrepreneurial teams can access a greater pool of resources, various skills, and network connections which may be synergistic and are vital to growing firms. Therefore, we anticipate that as the number of owners increases, so will growth expectations:

⁵ In the next section of the paper, we present evidences that absolute growth measures are more proper than relative growth ones because larger firms expect to provide more new jobs than will a large number of small firms.

Hypothesis 4: *The greater the number of owners, the greater the firm growth expectations.*

Financial resources are vital for start-up and growth. Financial resources are positively related to firm growth and performance (Bygrave *et al.*, 2003; Cooper *et al.*, 1994), while financial constraints hinder firm growth (Bosma *et al.*, 2004; Evans and Jovanovic, 1989). Thus, we expect a positive relationship between initial capital and firm growth.

Hypothesis 5: *The greater the amount of start-up capital required, the greater the firm growth expectations.*

In addition to a suitable amount of start-up capital, firm survival and success depend on the structure of this financing. Most entrepreneurs do not possess all of the start-up capital which they require. In such cases, there is a 'finance gap' between required and available financing. To close the gap, entrepreneurs may seek outside investors (Berger and Udell, 1998). As most firm growth requires external financing, the entrepreneur's willingness to involve outside money may be a good predictor of growth motivations and expectations. Moreover, outside investors, particularly business angels and venture capitalists, can also provide advice and other resources which aid firm growth (Landström, 1998; Mason, 2006) and will have expectations of firm growth that the entrepreneur is keen to meet. Due to data limitations, we examine only which entrepreneurs rely on personal savings or outside resources (bank credit, informal investment, venture capital). Based on the above reasoning, we expect that, independent from start-up funding, the reliance on external funding is positively related to growth expectations.

Hypothesis 6: *Compared to self-funded firms, firms that rely on outside financing are more likely to have higher firm growth expectations.*

Innovation, entrepreneurship and economic growth are inextricably linked (Acs, 1996; Acs and Audretsch, 1990; Acs *et al.*, 2004; Davidsson *et al.*, 2006; Wenekers and Thurik, 1999). Findings regarding the significance of innovation on growth vary by geography, industry, firm size, and data collection and measurement of innovation/ innovation spillover (Brouwer, Kleinkleht and Reijen, 1993; Griliches, 1980; Roper, 1997; Storey, 1994; Klepper, 1996). There are two important issues to consider: (1) the connection amongst innovation, age and growth and (2) the type of innovation and employment growth. While innovation influences growth positively irrespective of industry (Thornhill, 2006), the likelihood of innovation decreases with firm age (Huergo and Jaumandreu, 2004). Therefore, we expect a positive relationship between innovation and firm growth. Moreover, in parallel with life cycle theory, we anticipate that the effect of innovation will be larger for start-ups than for established businesses.⁶

⁶ The effect of innovation on growth should not be confused with other changes during the product life cycle, e.g. product innovation and variety is higher in the early phase of the product; process innovation and focus on productivity improvement strengthens at later phases.

Furthermore, while product innovation influences the growth of both employment and sales at the firm level, according to present examinations, process innovation can involve a displacement effect by decreasing the number of employees at a particular firm (Harrison *et al.*, 2005). As process innovation is more relevant to established firms, we expect that the application of new technology influences employment growth positively in the case of nascent and baby businesses, but is insignificant in the case of established businesses.

Hypothesis 7a: *The more innovative the firm, the greater the firm growth expectations, especially in the case of nascent and baby businesses as compared to established firms.*

Hypothesis 7b: *The more process innovations, the greater the growth expectations for nascent and baby businesses as compared to established firms.*

Another measure of product uniqueness and strategy is the level of competition. According to Wiklund (1998), well-positioned market niches with increasing customer demands are more worthwhile than highly saturated markets full of competition. Kim and Mauborgne (2005) highlight the positive effect of the less competitive “blue ocean” strategy on firm growth as opposed to a “red ocean” strategy with high competition. We expect that a firm facing less competition will have a greater opportunity to grow, while a firm with higher levels of competitions may be less likely to grow.

Hypothesis 8: *The lower the competition, the greater the firm growth expectations.*

Venture internationalization has attracted considerable research attention in recent years (Acs *et al.*, 2007; Davidsson *et al.*, 2006; Terjesen and Hessels, 2009). Despite liabilities of small size and foreignness, an increasing number of SMEs pursue international markets for their goods and services (OECD, 2000), aided by technological advances and falling transportation costs. SMEs access global markets directly via exports (e.g. Erramilli and D’Souza, 1993) and indirectly via intermediaries (e.g. Terjesen, O’Gorman and Acs, 2008; Hessels and Terjesen, 2009) and this trade is an important means by which the firm creates value, generates growth and accesses knowledge and technology (Hessels, 2008). While exporting is a risky strategy especially for start-ups and smaller businesses, we expect a positive relationship between export orientation and business growth.

Hypothesis 9: *The more export-oriented the firm, the greater the firm growth expectations.*

Extant empirical studies apply firm age as a continuous or discretionary independent variable, assuming a linear and structurally unchanged relationship between firm age and firm growth. However, we assume that the effect of the age on firm growth is more complex. As we examine businesses in three different life cycle stages, we have a good opportunity to examine change in the relative importance of personal and firm characteristics. We expect that individual factors

such as knowing an entrepreneur personally, perceiving good opportunity, having proper managerial skills and opportunity orientation play a more important role for nascent businesses and start-ups. As the business becomes larger and hires more employees and experts the relative importance of the entrepreneur and its characteristics diminishes.

Hypothesis 10: *The entrepreneur's demographics and personal context are a more important determinant of growth expectations of nascent and baby firm growth expectations, than of established firm growth expectations.*

Finally, environments vary in their ability to shape firm motivations and to enable firm growth, e.g. such dimensions as dynamism, heterogeneity, hostility and munificence (Dess & Beard, 1984).

National Environment Characteristics

The connection between the development of a country and the level of entrepreneurial activity has generated great debate in research and policy arena. Fast-growing firms are most commonly found in dynamic industries and regions (Carroll and Hannan, 2000; Jovanovic, 1982).

Research in OECD countries reports that entrepreneurial activity declines as a country develops (Audretsch and Thurik, 2004; Van Stel *et al.*, 2005; Wennekers *et al.*, 2005; Carree *et al.*, 2007), therefore an L-shape curve best describes the connection. However, using GEM data from over forty countries, Acs *et al.* (2004) describe the relationship between entrepreneurial activity and economic development as a U-shape. According to Acs (2007), entrepreneurial activity is higher in the cases of the lowest and highest developed countries, but lower for countries at a medium level of economic development. The premise is that, as a country develops, established businesses strengthen and necessity entrepreneurship declines. In the case of developed countries, entrepreneurial activity increases again, but this time due to opportunity oriented start-ups. While we do know that the examination of the connection between firm growth and development could deserve more attention, in this paper, we test only one corollary of the U-shape theory that relates business growth with development. Based on Acs (2007), established businesses are expected to grow faster in the medium and low developed countries while start-ups grow faster in the developed countries. Therefore, we expect:

Hypothesis 11a: *The more developed the country, the greater the growth expectations of start-up firms.*

Hypothesis 11b: *The more developed the country, the smaller the growth expectations of established firms.*

DATA & METHODOLOGY

To test our hypotheses, we use Global Entrepreneurship Monitor (GEM) data from the 2003 and 2004 individual adult population surveys in 35 countries.

Each year, GEM surveys adult population representative samples of between 1,000-42,000 individuals in each country and harmonizes the data to provide a measure of the prevalence of entrepreneurial activity. The annual surveys are gathered between May and August.⁷ From over 240,000 data points, we select only those individuals with nascent, baby and/or established businesses. After eliminating observations that are inconsistent or have critical missing values, we use a sample of 25,384 individuals. Of these, the present study includes 5,588 nascent, 6,929 baby, and 13,524 established firms.

Examining the factors of growth is very sensitive to several factors including the method of estimation, functional form and definition of growth and size (Heshmati, 2001). GEM data measures of expected –not actual– growth, however expected and actual growth are strongly and positively correlated (Autio, 2005; Cassar, 2006; Davidsson, 1989; Liao and Welsch, 2003; Wiklund and Shepherd, 2003). As we expect that the determinants of business growth differ for nascent, baby and established businesses, we run three separate stepwise OLS regressions.⁸ Another important methodological problem is the selection of absolute and relative growth measures. Table 1 contains the descriptives of current number of jobs and expected number of jobs in five years for firms at all three stages.

TABLE 1
NUMBER OF JOBS NOW AND IN FIVE YEARS AMONG NASCENT, BABY,
AND ESTABLISHED FIRMS

Firm type	Number of observations	Average Number of jobs/ expected jobs	Total number of jobs/ expected jobs
Baby firm: current number of jobs	6,929	13.48	91,318
Start-up firm: number of jobs expected in five years by nascent and baby firms	12,517	24.40	312,438
– Nascent (share of start-up total; e.g. number of jobs expected in five years by nascent firms)	5,588	20.95	120,198
– Baby (share of start-up total; e.g. number of jobs expected in five years by nascent firms)	6,929	27.21	192,240
Established firm: current number of jobs	13,524	15.33	214,814

⁷ For a detailed description of GEM methodology, see Reynolds *et al.* (2005).

⁸ Given data restrictions, we could use only relative growth for baby and established businesses. However, the selection between absolute and relative growth measurement has an important consequence that is associated with the present size of the business. The selection of either absolute or relative growth depends on whether the smaller number of large or the much larger number of small businesses creates more growth.

Firm type	Number of observations	Average Number of jobs/ expected jobs	Total number of jobs/ expected jobs
– Current jobs at established firm: 0	4,413	1.22	5,699
– Current jobs at established firm: 1-4	5,974	2.59	15,801
– Current jobs at established firm: 5-9	1,417	3.72	5,361
– Current jobs at established firm: 10-19	834	3.76	3,165
– Current jobs at established firm: 20-49	514	9.70	5,146
– Current jobs at established firm: over 49	372	200.21	72,177
Established firm: number of new jobs expected in five years	13,524	7.70	107,350

Table 1 clearly shows support for the absolute growth measurement. The 13,524 established firms collectively expect to add 107,350 new jobs in the next five years, or 7.7 per firm. Of these 107,350 new jobs, 72,177 (67% of the total new jobs) are expected to be created by the 372 businesses that have presently more than 49 jobs. The linear connection between business size and new job creation is clear from Table 1: the smaller the firm, the smaller the increase in the number of new jobs. Consequently, the absolute growth measurement that supports large businesses is more suitable than the relative measure.⁹

Table 1 also indicates that entrepreneurs of nascent and baby firms have higher growth expectations than do entrepreneurs of established firms: 75% of all newly created jobs are expected to come from early-stage firms. This indicates that younger businesses are expected to grow faster than established firms, denying Gibrat's law and agreeing with most of the empirical studies.

Our regression incorporates two types of growth (dependent) variables, different for early-phase (nascent and start-ups) and established businesses. We use eight categories to capture existing firms' five year job creation expectation and seven categories of start-ups' five year job creation expectations.¹⁰ As the factors of growth, we apply three levels of variables: individual, firm and national environment. Table 2 describes the variables.

⁹ The correlation between business size and relative growth is opposite in the case of small firms: small firms grow faster than large firms.

¹⁰ The reason of the application different categories is simple: negative growth is possible among established firms, but not among nascent and start-up businesses.

TABLE 2
VARIABLES

<i>Firm types</i>	
Nascent business owner	Nascent business owner and/or manager (dummy)
Baby business owner	Baby business owner and/or manager (dummy)
Established business owner	Established business owner and/or manager (dummy)
<i>Individual Variables</i>	
Age	Entrepreneur age (6 categories)
Age squared	Entrepreneur age squared (6 categories)
Gender	Female (yes = dummy)
Work status	Has a full-time job (yes = dummy)
Education	Has more than a post-secondary education (yes = dummy)
Household income	Household income (3 categories: bottom 1/3, middle 1/3, top 1/3)
Personal knowledge of entrepreneur	“You know someone personally who started a business in the past two years” (yes = dummy)
Has start-up skills	‘You have the knowledge, skill and experience required to start a new business’ (yes = dummy)
Good start-up opportunity	‘In the next six months, there will be good opportunities for starting a business in the area where you live’ (yes or no dummy)
Motivation	Opportunity (dummy), Necessity, Mixed (opportunity and necessity)
<i>Firm Variables</i>	
Number of current employees	Current firm size by number of employees (6 categories: 0, 1-4, 5-9, 10-19, 20-49, over 49)
Number of owners	Number of owners (4 categories)
Outside investors	Use of non-owners’ start-up capital (dummy)
Start-up money	Amount of start-up capital required (5 categories)
Product innovativeness	Level of innovativeness to customers of product/service (3 categories)
Expected competition	Level of competition (3 categories)
New technology	Technology was unavailable one year ago (yes = dummy)
Export	Percentage of goods/services for export (6 categories)
<i>National Environment Variables</i>	
Economic Development	Economic development based on GDP per capita (GDPPC) (3 categories where lowest = below US\$ 5,000, medium-developed = GDPPC US\$ 5,001-20,000, and most-developed = GDPPC over US\$ 20,000)

To test our hypotheses, we apply stepwise regression and report only significant (10%) variables in the regression. To avoid endogeneity in the case of baby firm size and expected growth, we apply the instrumental variable approach, i.e. the original “business size” variable was replaced with predicted values from an OLS stepwise regression with business size as the dependent variable.¹¹

RESULTS AND DISCUSSION

Table 3 depicts the results of the stepwise OLS regression. Expected job growth in five years is measured in absolute terms and grouped into categories is applied as dependent variable.

As shown in Table 4, there are a large number of significant variables, with seven significant in the cases of all three sets of firms. We now report the findings related to the eleven hypotheses.

Hypothesis 1 relates the demographic characteristics of the entrepreneur. Of the demographic characteristics, gender is most important. As expected and in all three cases, compared to their female counterparts, male entrepreneurs expect their firms to grow faster. Entrepreneurs who possess more than a post-secondary education degree are positively and significantly more likely to report more growth-oriented nascent firms, however entrepreneurs’ formal education is insignificant for baby and for established firm growth expectations. Younger age is positively related to growth expectations among baby and established businesses. We also tried to test the quadratic effect of age on growth, but it is not supported by the regressions and the working status of the entrepreneur is insignificant in any cases. Higher household income is significant only in the case of established firm growth expectations.

Hypothesis 2 contains the expected effect of individual behavioral variables on business growth expectations. Recent personal acquaintance with an entrepreneur and the ability to see good business opportunity is positively and significantly related to business growth in all three cases. It is interesting that start-up skills and motivation are positive and significant for the baby and established firms and insignificant for nascent firms. Altogether, individual behavioral characteristics seem to influence business growth more significantly than individual demographic characteristics.

However, firm characteristics are amongst the most influential factors of expected growth. Firm size is the most important positive influential factor in baby and established firms capturing most of the total variation.¹² Thus, hypothesis 3 is supported.

The number of owners is also an important factor of business growth except for baby firms. Firms with more owners and larger entrepreneurial teams are likely to draw from more business expertise, managerial skills, personal network and other resources crucial for successful business growth. Therefore, hypothesis 4 is supported.

¹¹ The independent variables were the same as in the case of the business growth equation.

¹² We have no data on nascent firms.

TABLE 3
STEPWISE REGRESSION: NASCENT, BABY AND ESTABLISHED FIRM GROWTH EXPECTATIONS

	Model 1: Nascent firms			Model 2: Baby firms			Model 3: Established firms		
	Beta	t-value	Signif.	Beta	t-value	Signif.	Beta	t-value	Signif.
Constant		1.97	0.05		-7.33	0.00		3.00	0.00
Development	-0.17	-9.23	0.00	-0.05	-3.92	0.00	-0.10	-10.76	0.00
Gender	-0.07	-4.28	0.00	-0.05	-4.18	0.00	-0.05	-5.86	0.00
Age				-0.09	-7.88	0.00	-0.09	-10.33	0.00
Household income							0.02	2.54	0.01
Education	0.03	1.67	0.10						
Personal acquaintance with entrepreneur	0.06	3.86	0.00	0.04	3.76	0.00	0.05	5.41	0.00
See good start-up opportunities	0.03	1.70	0.09	0.05	4.52	0.00	0.05	6.09	0.00
Has start-up skills				0.02	1.98	0.05	0.03	3.60	0.00
Motivated by opportunity				0.04	3.69	0.00	0.05	5.00	0.00
Business size	n.a.	n.a.	n.a.	0.35††	27.11	0.00	0.21	21.98	0.00
Number of owners	0.16	9.69	0.00				0.09	10.04	0.00
Start-up capital	0.30	15.98	0.00	0.03	2.77	0.01	n.a.	n.a.	n.a.
Outside investors	0.06	3.70	0.00	0.02	1.78	0.08	n.a.	n.a.	n.a.
Product new to customers	0.09	5.36	0.00	0.05	4.62	0.00	0.04	4.87	0.00
New technology	0.07	4.41	0.00						
Expected level of competition	0.05	3.24	0.00	0.04	3.27	0.00	0.02	2.34	0.02
Export	0.09	5.48	0.00				0.03	3.36	0.00
Nascent business owner†							0.02	2.35	0.02
Baby business owner†	-0.04	-2.69	0.01	-0.03	-2.82	0.00			
Established business owner†	-0.07	-4.19	0.00						
Adjusted R Square	0.19			0.17			0.13		

Note: Non-significant findings are not reported; † Control variables; n.a: no data available;

†† estimated value of business size is applied to avoid endogeneity

Start-up capital data is available only for nascent and baby businesses. Start-up capital is the single most important determinant of nascent businesses' expected growth, but less important for baby businesses. The effect of initial capital seems to diminish over time. Hypothesis 5 is supported.

Having other financial resources than owners is significant for both nascent and baby businesses, supporting the idea that the presence of outside investors is positively related to expected business growth, holding all the other variables, including the amount of money, constant. The importance of outside investors decreases for baby business, as the size of parameter becomes smaller, but remains significant. Therefore hypothesis 6 is supported.

Firm-level innovation variables are also supported. Newness of product/service is positively and significantly related to firm growth expectations in all cases. New technology is significant only in the nascent business case and insignificant in the established business case, as expected. The exception is the baby business where new technology is also found to be insignificant. Therefore, even in the case of young business, technology development could involve the substitution of labor with capital. It is also worth noting that all three innovation variables are significant for nascent firm growth expectations. Altogether, hypothesis 7a and 7b are supported.

The expected level of competition is also significant in all three cases. A "blue ocean" strategy is associated with higher expected growth: As the number of competitors decreases, entrepreneurs expect higher rates of business growth. Thus, hypothesis 8 is supported.

Export orientation is significant for the nascent and established business cases, and insignificant for baby businesses meaning that with larger proportions of export sales related to higher growth expectations, mainly supporting hypothesis 9, and underlying the importance of internationalization in business growth.

Next, we hypothesized that personal context variables play an important role for start-up growth while business behavioral variables should be more important in the case of established businesses. Our results do not support this hypothesis, we could rather say the opposite: personal characteristics are more important for established businesses. However, the differences are unconvincing in any case, therefore hypothesis 10 is rejected.

To gain support for the U-shape theory of economic development and entrepreneurial activity, both hypotheses 11 and 12 must be supported. However, the development variable is negatively and significantly connected to growth in all three cases. Thus, in our sample, the highest firm growth expectations are most often found in the less-developed countries and the lowest firm growth expectations are most often found in the highly-developed countries. This indicates support for the L-shape, rather than the U-shape, relationship between entrepreneurial activity and economic development. See Table 4.

As shown in Table 4, the mean of expected jobs is highest in the developed countries and lowest in the least developed countries in the case of start-ups (nascent and baby businesses together). This is exactly the opposite what we found in the previous regression. Why might this be? A small percentage of start-ups in developed countries create a high number of new jobs and these fast growing gazelle firms are mainly missing from countries with low to medium levels of development. A further explanation is that the termination rate in the developing countries is higher than in the developing countries, causing dif-

TABLE 4
THE NUMBER AND AVERAGE OF CREATED NEW JOBS BY
NATIONAL ECONOMIC DEVELOPMENT

	Number of observations	Jobs expected in 5 years	Average number of jobs expected in five years
Least-developed countries			
Start-up (baby and nascent firm): jobs	3,856	52,559	13.75
Established firm: jobs	2,223	17,351	7.39
Medium-developed countries			
Start-up(baby and nascent firm): jobs	873	12,065	14.34
Established firm: jobs	981	5,887	6.10
Highly-developed countries			
Start-up(baby and nascent firm): jobs	7,892	247,823	30.07
Established firm: jobs	10,321	84,096	7.91

ferences in the average business age. The same story holds for the established business case with two differences: (1) the difference in the mean of established business size is much smaller in terms of development than in the cases of start-ups and (2) the medium developed countries' established businesses have the lowest average firm size.

Taken together what can we say about hypotheses 11 and 12? Our results are contradictory, indicating that average business growth, independent of start-ups and established firms is higher in lower developed countries, while comparatively few businesses, overwhelmingly in the developed countries, created or are willing to create the majority of new jobs. Based on the regression results, hypothesis 11 is rejected and hypothesis 12 is accepted, while the analysis depicted in table 4 concludes exactly the opposite. Further examination is necessary to clarify the nature of start-up and established business growth in the developing and developed countries.

We wish to acknowledge some limitations. We use expected rather than actual growth data, however growth aspiration (expected growth) is a good predictor of actual growth (Autio, 2005; Cassar, 2006; Davidsson, 1989; Liao and Welsch, 2003; Wiklund and Shepherd, 2003). A second limitation is the application of the absolute, rather than a relative, growth measure. Potential selection bias

problems can also emerge because we compare existing businesses and do not have any information about the firm that did not survive (for selection biases see Bertrand and Sendhil, 2001). However, we do believe that this bias does not influence our results significantly as failure rates are higher amongst younger and smaller firms. If we had applied relative growth rates that favors smaller, rather than larger, firm growth, the selection bias would be more serious. A fourth potential drawback is the neglect of environmental and country-level variables. However, the latter definitely implies the application of other econometric methods. Furthermore, previous research identifies several variables linked to firm growth (e.g. individual management experience, firm legal form, strategic linkages with large firms, industry) (Davidsson *et al.*, 2006), however these are unavailable in the GEM study. Sixth, we use only two points to measure growth. Finally, we do not test for interaction effects across levels.

CONCLUSION

The effect of individual and firm level demographic and individual/strategic factors on business growth is the subject of many prior investigations. Our findings just underline and generalize these results by employing a large multi-country dataset. Of the individual demographic variables, gender (being female) has the most important negative effect on business growth. Young age is positively and significantly related to higher growth expectations in baby and established firms, higher household income only for established firms, while higher education degrees are positively related to nascent firm growth expectations. The entrepreneur's personal context, especially personal acquaintance with an entrepreneur and recognizing good start-up opportunities, positively influences firm growth expectations. Start-up skills and opportunity motivation are related to growth expectations of baby and established firms, but not nascent firms.

Initial start-up funding is an important positive predictor of nascent firm growth expectations, and a significant but less important predictor of baby firm growth expectations.¹³ Taken together, size-related determinants, start-up funding amount, number of owners and the initial firm size explain most of the variations in expected business growth. New product innovation and limited competition significantly impact business growth in all three cases, but the magnitude of the effect decreases as the start-up phase ends and the business matures. Moreover, their relative importance is much less than the previously mentioned size-related factors. Technology innovation positively influences expected employment growth only in the case of nascent business, and insignificantly in the baby and established business categories implying a compensating effect of employment with capital. This is consistent with recent findings of Harrison *et al.* (2005). Internationalization by export orientation appears to be important for nascent and established firms, but again, the magnitude of the effect is not high. Overall, firm growth expectations are more strongly related to firm, rather than individual, characteristics. Among individual characteristics, the number of owners is the

¹³ We do not have data on start-up capital requirements for established firms.

greatest predictor of growth expectations- highlighting the importance of team, over individual efforts.

While previous studies refute Gibrat's law, most empirical findings imply a negative relationship between size and business growth. However, this result is sensitive to the selected factor (number of jobs, sales, profit etc.), the length of examined time period and the way of measurement (e.g. absolute or relative growth). A careful examination of the job creating effect of different size firms implied that absolute growth measure at least in the case of employment is improper as opposed to relative measures. Applying absolute expected job increases over five years, growth expectations are higher for nascent and baby firms than for established firms, a finding that is consistent with most previous empirical findings. However, in contrast to earlier published research, we find that a firm's initial size is the single most important positive determinant of business growth expectations. This finding is perhaps the most novel contribution of our paper. Why might initial size drive growth expectations? As mentioned earlier, there are few longitudinal studies of firm growth. The present study provides a detailed picture of the importance of several factors at three venture life stages. As GEM is not longitudinal, the present study reports only cross-sectional data from firms at three specific stages: nascent, baby and established. Our results indicate that nascent firms' expected growth is most influenced by start-up capital amount and the number of owners. Among baby firms, current business size is the most important variable. Therefore, those businesses grow larger amongst young businesses that have grown larger in the first two years of establishment.¹⁴ Size is also the most important determinant of established firms' growth expectations. Our results indicate that the "dice are thrown" by the time a firm is two years old. Most growth occurs in the early phase of start-up, with later growth at slower rates. Large established firms became grow larger. In contrast, a firm started by a solo entrepreneur, with few employees and limited start-up capital, has little change of growing, especially beyond the first few years. This finding highlights the importance of directing entrepreneurship policy to early phase firms.

Over the years, two alternative approaches explain the connection between various entrepreneurial activities and development: the L-shape and the U-shape theory. We examine two statements of the U-shape idea of entrepreneurial development for growth rates of start-up and established firms. The contradictory results necessitate further research. However, there is enough evidence to state that a small fraction of firms provide the majority of job creation, and these gazelle firms are found in larger number in developed countries. At the same time, average business growth is higher in more developed countries. A policy implication for countries with moderate levels of development is the suggestion to focus on increasing the number of gazelle firms. This suggestion is consistent with a shift in focus from established firms' development to entrepreneurship policy.

While previous studies emphasize the role of start-ups in creating the majority of new jobs, we find that established firms account for almost 25% of new jobs. Similar to the young firms, only a small percentage of established firms

¹⁴ Two years is about the estimated average age of most baby firms (e.g. 0-42 months).

create the vast majority of the new jobs, perhaps the same firms that grew the most in the baby business phase. Altogether, our findings indicate that a few firms, both in cases of start-ups and established business, are responsible for most job creation. However, the magnitude of effect of start-up firms is much larger- around three times- than that of established firms, and this is a second key contribution of our paper.

Our findings suggest a number of directions for future research. First, there is a need for further examination of both new and established firms with “gazelle” growth ambitions. For example, besides internationalizing, firms can pursue organic and acquisition-based paths to growth. The present study does not explicitly deal with these options. We also acknowledge that many entrepreneurs do not aspire to grow, especially in terms of employee headcount, due to concerns (for example with losing the informal, family like quality of the business, Wiklund *et al.*, 2003). Future research could examine entrepreneurs’ disinterest in growth. At the external environment level, the present study utilizes a national measure of economic development. Further research could investigate the impact of more local environmental variables. Future studies of a more longitudinal nature could track firm growth at various points.

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