

High-Growth Aspiration Entrepreneurship

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Abstract

This paper jointly examines the determinants of entrepreneurship and high-growth aspiration entrepreneurship in 42 countries. Using the Global Entrepreneurship Monitor (GEM) surveys for 1998-2003, we analyse how the institutional environment and the entrepreneurial characteristics affect both individual decisions to become entrepreneurs and aspirations to set up a high-growth venture. We find that institutions exert different effects on entrepreneurial entry and on the individual choice to launch high-growth aspiration projects. A strong property rights system is important for high-growth aspiration entrepreneurship, but has less pronounced effects for entrepreneurial entry. While the size of the formal financial sector has a significant positive impact on high-growth aspiration entrepreneurship, the prevalence of informal funding matters more for entrepreneurial entry. In addition, high-growth aspiration entrepreneurship is strongly affected by the individual characteristics of entrepreneurs, in particular by their motivation, attitudes towards failure and social networks.

Keywords: high-growth aspiration entrepreneurship, entrepreneurship, start-ups, property rights, entrepreneurial finance

JEL classification codes: D23, D84, G21, J23, J24, K11, L26, P51

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1. Introduction

In this paper, we jointly investigate the determinants of individual decisions to become an entrepreneur and of aspirations to start up a high-growth business. We examine how various dimensions of the institutional environment, such as formal and informal financing, property rights and the degree of business regulation, as well as the individual characteristics of entrepreneurs, such as their social capital and attitudes to risk, jointly determine the entrepreneurial decision to create a new firm and the growth ambitions of the new entrepreneurs. Our framework generates hypotheses that distinguish between the factors leading people to choose to become entrepreneurs, and those motivating them to aspire to create firms of significant scale and therefore able to employ a number of workers in the future.² These factors include institutional features and the characteristics of the entrepreneurs themselves. We test our hypotheses using the Global Entrepreneurship Monitor (GEM) 1998-2003 surveys, which provide a large scale cross-country cross individual dataset containing 358,274 observations comprising 41 countries and at least 2,000 individuals in each country.

Entrepreneurship is increasingly seen as a vital force in economic development (Baumol 1990; Wennekers and Thurik 1999; Audretsch and Thurik 2004; Minniti et al. 2005; Minniti and Lévesque 2008). Entrepreneurs contribute to economic growth through generating, disseminating and applying innovative ideas; increasing competition and providing diversity among firms; enhancing economic efficiency and productivity (Cohen and Klepper 1992; Audretsch and Thurik 2004; Minniti et al. 2005). They are also an important engine for job creation, being responsible for anything from one-third to 70 per cent of job

² Hereafter, under a high-growth aspiration entrepreneurial activity we mean nascent entrepreneurs (as defined in the GEM project, see Figure 1) who expect to create ten jobs or more in five years' time. High-aspiration entrepreneurs represent about 38 per cent of all respondents involved in start-ups in our sample.

creation in the economy³ (Birch 1987; Storey 1994; Kirchhoff 1994; Westhead and Cowling 1995; Acs 1998; OECD 1998; Fölster 2000; Acs and Armington 2004). To understand the determinants of entrepreneurship, entrepreneurs' personal characteristics have been studied closely by researchers (Aidis et al. 2007; Aidis et al. 2008a; Grilo and Thurik 2004; 2005; Grilo and Irigoyen 2005; Ardagna and Lusardi 2008) as well as financial decision-making (Casser 2003; Korosteleva and Mickiewicz 2008), growth aspirations (Aidis and Mickiewicz 2006) and venture growth (Baum and Locke 2004). In this research along with socio-demographic characteristics of entrepreneurs such as age, gender, education and past working experience, the effects of entrepreneurial perceptions and attitudes has also been explored. Recent studies emphasize the impact of specific entrepreneurs' traits, skills, and motivation factors, including goals, locus of control perceptions, self-efficacy and communicated vision on venture growth (see for instance Harper 2003; Baum and Locke 2004).

Recognising the cross-country heterogeneity in entrepreneurship, a growing number of empirical studies have centred on the importance of institutional settings for entrepreneurship, using either aggregate cross country or individual data. For example sound property rights have been argued to be a significant basis for entrepreneurial activity (Johnson et al, 2002, Aidis et al, 2008) Informal financing is also considered to be an important source of start-up financing (Bates 1997; Bygrave 2003; Huyghebaert 2001; Korosteleva and Mickiewicz 2008) and a driver of early-stage entrepreneurial activity (Bygrave et al. 2003). The former strand of research analyses the determinants of cross-country prevalence rates of entrepreneurial activity (Van Stel et al. 2007), whereas the latter focuses on explaining an individual's decision to become an entrepreneur (Blanchflower and Oswald 1998, Blanchflower et al. 2001; Grilo and Thurik 2005; Grilo and Iriguen 2006; Aidis *et al.* 2007, 2008a). As yet, little empirical research has been undertaken on the effects which various institutional arrangements exert on the allocation of entrepreneurial efforts to specific types of entrepreneurial activity such as high-growth aspiration entrepreneurship which has significant job-creation potential. This type of entrepreneurial activity is

³ The mortality rate of new and small businesses is higher than for larger firms, so that job destruction figures for start-ups may be as high as job creation figures (Acs 1998; Aldrich 1999). However, even when controlled for this, the net effect remains positive (Autio 2005).

expected to benefit the economy via raising the overall employment rate and to be correlated with innovation, technological change and investment.

A related literature focuses on the determinants of venture growth (Davidsson 1989; Baum et al. 2001; Becchetti and Vergata 2002; Baum and Locke 2004; Delmar et al. 2003), growth expectations (Wiklund et al. 2003; Aidis and Mickiewicz 2006) and the link between growth expectations and actual growth (Wiklund and Shepherd 2003; Aidis et al. 2008c). This strand of research provides strong support for the existence of a positive link between entrepreneurs' growth aspirations and actual growth, justifying the importance of studying aspirations; in particular when these are high-growth aspirations.

Very limited empirical research has been undertaken on what determines high-growth aspiration entrepreneurial activity. Autio (2005, 2007) provides insights about cross-country and world regional patterns of a high-growth aspiration entrepreneurial activity, its associations with national entrepreneurial environment, and individual characteristics of high-growth aspiration entrepreneurs, but falls short of providing testable implications regarding the determinants of high-growth aspiration entrepreneurship. Bowen and De Clercq (2008) analyse the impact of the institutional environment on the allocation of entrepreneurial effort toward high-growth activities. Their study is a pioneering work on how various institutional arrangements determine a high-growth aspiration entrepreneurial activity, upon which we build. However, they use aggregate level data so their results may be subject to an endogeneity bias, given the possible reverse causality between the prevalence of high-growth entrepreneurship and institutional variables. Second, they estimate their models of high-growth aspiration entrepreneurship without reference to the decision to become an entrepreneur in the first place. In our study we address both issues, using cross-country individual-level data and applying Heckman selection models to take account of the possibility that the two choices are likely to be interdependent.

Overall, our contribution can be summarised as follows. First, our study attempts to distinguish which institutions matter the most for explaining, on one hand, entrepreneurial entry, and on the other hand, the high-growth aspirations of entrepreneurs. In particular, we develop a theoretical framework which argues that more developed institutions enable more sophisticated forms of economic

activity, namely high-growth aspiration entrepreneurship. Thus, for example, we argue that an underdeveloped financial system does not necessarily hinder entrepreneurship, because informal arrangements and social networks may substitute for it, but high-growth aspiration entrepreneurship does benefit from a more developed formal financial sector. Second, we employ a Heckman estimator that determines simultaneously the likelihood of entrepreneurial entry and the plans of entrepreneurs to launch high-growth aspiration projects. The Heckman estimator deals with potential sample selection problems which might arise if we considered only the subset of high aspiration entrepreneurs and we avoid losing the full sample information that unavoidably occurs when other estimators are employed.

Third, we use the GEM data set that contains rich individual-level information on entrepreneurs and combine it with information about country level institutional features. This addresses the potential endogeneity (simultaneity) bias noted above, because a country level variable cannot be affected by a single individual level characteristic. We also build on the set of institutional regressors identified by Bowen and De Clercq (2008) as shaping high-growth aspiration entrepreneurial activity, to include three important measures of institutional and financial environment: the property rights system, prevalence of informal financing and social capital. The property rights system is a fundamental characteristics of institutional quality and in the previous empirical research it has been shown to be a determinant of entrepreneurial entry and decision-making (Johnson et al. 2002; Aidis et al. 2007; 2008a; Korosteleva and Mickiewicz 2008).

We find strong property rights to be of particular importance for individual decisions to choose high-growth aspiration entrepreneurship, whereas they tend to play a less pronounced role in explaining the decision to start a new venture. Growth-oriented start-ups tend to rely more on formal external financiers, in particular banks but the size of informal funding exerts a less significant impact on high-growth aspiration entrepreneurship. We find that social capital mitigates some adverse effects of the business environment in which entrepreneurs operate and facilitates a high-growth aspiration entrepreneurial entry. We also find interesting results related to the importance of entrepreneurs' motivation factors and attitudes towards risk in explaining high-growth aspiration entrepreneurship.

The paper proceeds as follows. The next section discusses theoretical issues pertaining to the determinants of entrepreneurs' decision to set up high-growth aspiration ventures and presents the hypotheses to be tested. Section 3 describes the data and the methodology. Empirical results follow in Section 4. Finally, Section 5 presents conclusions and policy implications.

2. Determinants of High-Growth Aspiration Entrepreneurship: Theory and Hypotheses

A well-functioning business environment is likely to provide incentives to entrepreneurs in pursuing market opportunities for setting up new ventures and generating new jobs (North 1990, 1994; Baumol 1990, 1993; Djankov et al. 2002; Davidsson and Henrekson 2002; Harper 2003; Bowen and De Clercq 2008), while a weak institutional environment is an impediment to entrepreneurship (Johnson et al. 1999, 2000; McMillan and Woodruff 2002; Davidsson and Henrekson 2002; Aids et al. 2008). The quality of the institutional environment affects the allocation of entrepreneurial efforts among its various uses (Baumol 1990, 1993, 2005) and the potential of new firms to generate jobs is likely to vary with the institutional context.

Personal traits, competencies, motivation and cognition have been increasingly advocated to distinguish entrepreneurs from other individuals and to explain entrepreneurial strategies (Parker 2004; Aidis et al. 2007; Aidis et al. 2008a; Ardagna and Lusardi 2008; Korosteleva and Mickiewicz 2008). Facing an uncertain environment where additional information can only be acquired at a higher cost, individuals tend to adopt alternative cognitive strategies (DellaVigna, 2007). Cognitive factors, defined by Harper (2003:36) as the "individual's agency beliefs," affect entrepreneurial alertness to opportunities. More specifically, they comprise a "locus of control (or contingency expectations) and beliefs about self efficacy (or competence expectations)" which imply that the more individuals are convinced that certain outcomes are dependent upon certain actions and the more they are confident about their skills and capabilities, the more they are alert to new opportunities. While the entrepreneurial locus of control is largely affected

by the institutional environment, self-efficacy is dependent on individual characteristics of entrepreneurs, including their socio-economic backgrounds, attitudes and perceptions. More specifically, self-efficacy may be enhanced through the acquisition of certain skills and knowledge. Thus, Aidis and Mickiewicz (2006) find that entrepreneurs' 'learning by doing' attributes, acquired through previous working experience or additional entrepreneurial experience, are positively related to growth aspirations. An increasing number of empirical studies examine the impact of entrepreneurial traits for venture growth (Baum and Locke 2004; Aidis and Mickiewicz 2006). Baum and Locke (2004) find positive direct effects of goals, growth aspirations and self-efficacy for venture growth and indirect effects through interaction with other factors such as passion for work, tenacity and resource skill.

We therefore expect not only institutional factors, but also entrepreneurs' individual characteristics to play important role in explaining high-growth aspiration entrepreneurial activity. Our framework integrates institutional theory and the approach which stresses individual psychological traits of entrepreneurs and self-efficacy to study the choice of entrepreneurial strategies. Below we discuss each of these theoretical dimensions and postulate their likely importance for either or both entrepreneurship and high-growth aspiration entrepreneurship.

Drawing on the theoretical literature (North 1990, 1994; Baumol 1990, 1993; 2005) and the considerable body of empirical work (discussed below) we identify the three institutional dimensions which are likely to influence high-potential entrepreneurship: (1) the protection of property rights; (2) the extent of business regulation complexity; (3) supply of finance (i.e. supply of formal finance and prevalence of informal funding).

2.1 Protection of Property Rights

Strong property rights have been argued to exercise a fundamental positive effect on all economic activity, including entrepreneurship. Acemoglu and Johnson (2005) show that property rights institutions have pronounced effects on investment, financial development and long-run economic growth. Aidis's et al. (2007) empirical account reveals that among various institutional indicators, the property rights system plays the most pivotal role in determining entrepreneurial activity. Johnson et al. (2002) provide evidence that weak property rights

discourage entrepreneurs to reinvest their retained profits into business. Korosteleva and Mickiewicz (2008) find that strong property rights emerge as the key institutional dimension for entrepreneurial financial decision-making, though when they examine entrepreneurial entry and entrepreneurs' financial choices jointly, they fail to find any significant effects of property rights institutions for the decision of individuals to enter entrepreneurship.

In the classic studies on entrepreneurship (e.g. Kirzner, 1973; 1979) strong property rights were not explicitly discussed, rather assumed, because of the focus on developed economies. Nevertheless, the perspective changes once we consider a wider cross-country heterogeneity. Recent theories of entrepreneurship emphasise that “the institution of private property ... has an important psychological dimension that enhances our feelings of ... internal control and personal agency, and it thereby promotes entrepreneurial alertness” (Harper 2003, p. 74). For entrepreneurship, it is also important that the property rights not only guarantee the status quo but also include the ‘find and keep’ component, which is essential for the aspects of entrepreneurship related to discovery, innovation and creation of new resources (Harper 2003). Unlike Acemoglu and Johnson (2005), we regard (narrowly defined) property rights as difficult to separate from contracts rights, especially, when we focus on the economic concept of property rights (including the rights of use and transferability); the crucial notion for entrepreneurial activity.

Based on this, our first hypothesis is formulated as follows.

H1: Strong property rights are likely to encourage both entrepreneurial entry and high-growth aspiration entrepreneurship.

As noted above, there remains considerable debate about which are the most significant elements of property rights for entrepreneurship. Our emphasis is on a broad definition of property rights, but in our empirical work we are concerned that results are not driven by specification errors and hence we use a variety of measures. For example, intellectual property protection can be of particular importance to high-growth entrepreneurs, provided that they are more likely to launch high-technology businesses. Bowen and De Clercq (2008) use a sub-component of property rights that relates to the intellectual property rights

protection⁴. Weak property rights may also result in corruption, and the two phenomena are correlated. However, corruption may have other determinants and may be seen as an outcome variable proxying for a general weakness of the institutional environment (Djankov et al. 2002). Like weak property rights, corruption brings uncertainty into the business environment and therefore may discourage entrepreneurs from starting new businesses or prevent businesses from growing to avoid expropriation of their profits (Choi and Thum 2005; Aidis and Mickiewicz, 2006; Aidis et al. 2008a). In our empirical tests we will verify if our results on property rights are robust to a variety of specifications, including one with a corruption indicator.

2.2 Business Regulation Complexity

According to public interest theory, unregulated markets are more prone to failures. Stricter entry regulation, requiring a better screening of new firms, will allow for the entry of only those firms which meet certain standards for providing a quality product or service of benefit the society (Bennett and Estrin, 2006). On the other hand, public choice theory views regulation as potentially inefficient, with industry incumbents being most likely the beneficiaries. Once able to influence regulation in their favour, incumbents restrain competition and the entry of new firms. In their study of the regulation of entry of start-ups in 85 countries Djankov et al. (2002) find that countries with overly regulated business environment have higher level of corruption and larger unofficial economies, providing supporting evidence for the public choice theory argument. Empirical studies on business regulation conform to the proposition that overregulated environment inhibits all varieties of entrepreneurial entry (Grilo and Thurik 2005; Grilo and Irigoyen 2006; Van Stel et al. 2007). Van Stel et al. (2007) find that minimum capital requirements and rigidity of labour markets regulation discourage the entry of new firms. In their study of entrepreneurship in 15 old EU member states and US, Grilo and Thurik (2005) find that administrative complexities not only have a negative impact on entrepreneurial entry, but also

⁴ In our sample, of those who are high-growth aspiration entrepreneurs, about 35% report their product or service is new to all or some customers. However, the correlation coefficient between high-growth aspiration entrepreneurship and product innovativeness is low (12%).

on an entrepreneurial drive (or 'latent entrepreneurship'; see Blanchflower et al. 2001; Grilo and Irigoyen 2006). Regulatory constraints are found to be of particular detriment to opportunity-driven entrepreneurship (Ardagna and Lusardi 2008). Entry regulation barriers can delay the introduction of new product varieties in expanding industries, lowering the entry rate (Ciccone and Papaioannou 2006) while lower entry barriers are positively associated with the rate of firm entry (Klapper et al. 2006; Demirguc-Kunt et al. 2006)⁵. However, contrary to their expectations, Aidis et al. (2008a) fail to find any significant effects of start-up entry barriers on entrepreneurial entry and Bowen and De Clercq (2008) report that regulatory complexity does not have any significant impact on high-growth entrepreneurship.

However, these studies all use either individual or cross-country data and do not seek separately to model simultaneously the determinants of different varieties of entrepreneurship. Hence our second hypothesis is formulated as follows:

H2: Complex business entry regulations discourage individuals both to enter entrepreneurship, and to choose high-growth aspiration entrepreneurship.

2.3 Finance

The lack of finance or its high cost has been recognised as major impediments to entrepreneurship (Stanworth and Gray 1991; Storey 1994; Beck et al. 2005; OECD 2006). Lack of credit history and shortage of collateral distinguish new firms from established ones. Given small scale of entrepreneurial projects, financial institutions find it hard to monitor small firms. The situation is aggravated by the perception that start-ups have higher risk of failure. Taken together, this restrains start-ups' access to external finance and raises the relative cost of different forms of finance (Huyghebaert and Gucht 2007, Korosteleva and Mickiewicz 2008). However, these constraints are likely to be somewhat alleviated in more developed financial markets through the wider allocation of savings to potential investment projects and the facilitation of risk management (Levine 1997; Levine et al. 1999). With a wider supply of finance

⁵ Note however that both studies are limited to incorporated firms only.

and competition, financial institutions are motivated to experiment with more challenging financial options, including entrepreneurial finance. Consistent with this, financial development is found to have significant and positive effects for entrepreneurial entry (Van Stel et al. 2007; Aidis et al. 2008a) and for firm financing and growth (Kumar et al. 2002; Demirgüç-Kunt and Maksimovic 1998, Beck et al. 2005). A wider supply of finance is particularly beneficial for small firms compared to the larger ones (Becchetti and Trovato 2002; Beck et al. 2005; Grilo and Irigoyen 2006).

Previous studies show that start-ups typically exhibit moderate levels of formal external financing, typically relying on their own equity and informal financing (Bates 1997; Bygrave 2003; Huyghebaert 2001). For new entrepreneurial projects, 'internal governance' structures based on personal trust within the social groupings based on family and local friends (Harper 2003) may be superior to impersonal costly monitoring by the formal financial institutions, facilitating access to informal finance. Korosteleva and Mickiewicz (2008) distinguish between formal and informal supply of finance. They estimate its joint effects on both the decision of individuals to enter entrepreneurship and entrepreneurs' financing options. They find significant effects of the size of informal financial sector on entrepreneurial entry though the effect of the formal supply of finance is insignificant.

However, the scale of informal finance is limited and is usually insufficient for larger projects. Moreover, even if informal finance was available, informal financiers may be reluctant to concentrate their risk on small numbers of large projects. In contrast, provided that there is a constant fixed (set-up) cost element in monitoring any project by the financial institutions, larger projects exhibit economies of scale and become more attractive to the formal financial institutions. Accordingly, Bygrave (2003) argues that while informal financing is accessible to all entrepreneurs, formal finance plays a more significant role for 'star' firms. High-growth entrepreneurs, high-technology firms and export-oriented small firms may all fall within the latter category.

Based on this, our next hypothesis reads as follows.

H3a: Informal financing is likely to have more pronounced effects on entrepreneurial entry than on high-growth aspiration entrepreneurship.

H3b: The size of the formal financial system is expected to be positively related to high-growth aspiration entrepreneurship, but less so to entrepreneurial entry.

2.4 Social capital, experience and personal cognitive determinants of the entrepreneurial alertness

Self-efficacy “arises from the cognitive appraisal of one’s capabilities”; it is important in explaining an individual’s alertness to entrepreneurial opportunities and may be enhanced by social learning (Harper 2003). In particular, business networks, also referred to as social capital or trust, are found to play an important role for entrepreneurs via social learning using role models (Minniti et al. 2005) and in assisting them to access the resources required for business creation (Aldrich et al. 1987; Djankov 2006; Nanda and Sorensen 2007; Aidis et al. 2008a; 2008b). Social capital also facilitates entrepreneurs’ access to finance (Aldrich et al 1987, Johannisson 2003) and is often regarded as an intangible asset that can be used to overcome difficulties arising from failure of formal institutions.

In particular, previous entrepreneurial experience can make subsequent repeated entry more likely, as it enhances self-efficacy both through the “direct mastery experience (learning by doing) and vicarious experience (learning by seeing)” (Harper 2003, p. 46), since any business activity implies intensive contacts with other entrepreneurs. On the other hand, an existing business ownership implies that the opportunity cost of new involvement is high, and the latter would be chosen only if its expected net present value is significant, as is the case with high-growth aspiration projects.

Accordingly, our third hypothesis reads as follows.

H4: Being an owner of an established business is positively associated with high-growth aspiration entrepreneurship, but not with entrepreneurial entry.

A number of scholars have articulated the influence of risk aversion on an individual decision to become entrepreneurs (Kilhstrom and Laffont 1979; Cramer

et al. 2002; Caliendo et al. 2007). The conventional wisdom is that individuals with lower risk aversion are more likely to get engaged into entrepreneurial activity. Kilhstrom and Laffont (1979) construct a competitive general equilibrium model of the firm under uncertainty that explains the firm on the basis of differential risk aversion between entrepreneur and worker. Their model is based on Knight (1921), which distinguishes between risk and uncertainty, viewing the former as situations in which one can assign probabilities to outcomes and the latter when one cannot. This distinction has given rise to the debate on objectivity and subjectivity of probability. To the extent that the evaluation of probability is rooted into a decision-makers subjective assessment, all probabilistic situations can be measured and therefore are matters of risk (Langlois and Cosgel 1993). In their study of determinants of nascent entrepreneurial activity based on GEM data Arenius and Minniti (2005) utilise perceived fear of failure as a subjective measure of attitude to risk. They find that an increased fear of failure, associated with higher risk aversion, discourages nascent entrepreneurial activity. Similarly, Ardagna and Lusardi (2008) find fear of failure as a significant negative predictor of total entrepreneurial activity in the 2001-02 sample of GEM countries. However, because more is at stake for high-growth aspiration entrepreneurs, and because they are more likely to be undertaking market-related activities, rather than self-employment or an extension of family work (Parker, 2004), we hypothesise as follows.

H5: Fear of failure discourages high-growth entrepreneurship.

3. Data and Methodology

3.1 Sample Description

In our study we utilize the data collected through the GEM adult population surveys in 1998-2003 that covers 41 countries worldwide⁶. The data consists of representative samples of at least 2,000 individuals in each country. The samples are drawn from the working age population that allows avoiding the selectivity

⁶ For countries included into the 1998-2003 datasets and year coverage see Reynolds (2005).

bias that often confounds other studies, which focus on the existing entrepreneurs only. GEM surveys were completed through phone calls and through face-to-face interviews in countries, where low density of the telephone network could create a bias. National datasets are harmonised across all countries included in the survey⁷.

The GEM data gives the opportunity to examine cross-national entrepreneurial activity, while capturing the widest possible range of business creation activities. Respectively, we can distinguish between (a) individuals who intend to create a new venture, (b) who are in the process of establishing a new firm (or start-ups, classified as nascent entrepreneurs)⁸, (c) currently operating young firms (under 3.5 years)⁹, and (d) other owners-managers of established businesses. We can also distinguish between the opportunity- and necessity-driven entrepreneurship and high- and low-growth aspiration ventures. For the purpose of this study we will focus on start-ups, and distinguish between high-growth aspiration and no-growth oriented ventures. The GEM dataset provides unique information on entrepreneurs' personal characteristics, ranging from standard socio-demographic-economic characteristics to more specific entrepreneurial traits, perceptual and attitudinal variables. In the next subsection we discuss variable definitions and measurements in more detail.

3.2 Variable definitions and measurement

We utilise a set of various country-level measures of institutional environment along with individual-level variables. We can safely use aggregate-level explanatory variables without being concerned about simultaneity bias: the individual decision of a potential entrepreneur should not affect country-level institutions or economic development. This gives us some comparative advantage over Bowen and De Clercq's (2008) study, whose model may be subject to endogeneity bias.

There is no universally accepted set of measures of institutional quality. So far, many scholars have largely relied on what is commonly referred to as

⁷ For more details of the sampling procedure see Reynolds et al. (2005, 2008).

⁸ According to the GEM criteria, start-ups or nascent entrepreneurs are defined as individuals between 18-64 years old, showing some action towards setting up a new business whether fully or partly owned. They also must not yet have paid any wages or salaries for more than three months (for summary of this definition see Figure 1).

⁹ These two categories constitute together total entrepreneurial activity (Reynolds et al. 2005).

institutional outcome variables (Glaser et al. 2004). These include survey indicators provided by the International Country Risk Guide (e.g. a measure of risk of expropriation), the World Bank measures of Governance effectiveness; the World Bank's Doing Business indicators; and the Heritage Foundation / Wall Street Journal indices. In this study, we rely on the Heritage Foundation – Wall Street Journal 'Economic Freedom' Indicators, World Bank 'World Development Indicators', and the aggregate peer effects based on the GEM adult population survey, calculated by the authors. More specifically, we use the Heritage Foundation 'Business Freedom Index' (BFI) to measure the rigidity of business regulation. It reflects various barriers to start, operate and exit businesses (Beach and Kane 2008). To achieve better distributional characteristics of our variable we apply a logistic transformation to the original index.¹⁰

Using the World Bank Doing Business start-up regulation data in our analysis is an obvious alternative, but there are two problems with that dataset for our purposes. Most importantly, it does not cover the time period of our study. The World Bank Doing Business data starts from 2003, whereas our sample covers 1998-2003. Second, while institutions should be seen as stable, there is considerable time variation in World Bank entry barriers indicators. The Djankov et al. (2002) study, that preceded launching the Doing Business project, contains data for 1999. If there were little time variation in the data, we could introduce start-up regulation variables as time-invariant. However, after comparing Djankov data for 1999 and the Doing Business dataset for 2003, we discovered substantial variation in start-up regulatory measures (in particular, in those related to time and cost to open a new venture) over this relatively short time period. Nevertheless, the number of entry procedures was the most stable indicator, and we offer robustness checks based on it.

For property rights, the Heritage Foundation / Wall Street Journal index of property rights, which has broad coverage, has been commonly used by other scholars (Acemoglu and Johnson 2005; Aidis et al. 2007; also see further references therein). The Heritage Foundation 'property rights' indicator shows the degree of protection of individuals' private property rights by law on books and through its enforcement, and the extent to which private property is protected

¹⁰ For transformation we use the following formula: $[(100-Index)/Index]$.

from expropriation (Beach and Kane 2008). To improve the distribution, the index was transformed into odds to denote strong property rights, implying that the stronger the property rights (i.e. they are fully guaranteed by the government and the contract enforcement is strong), the higher is the transformed indicator¹¹.

To measure the extent of intellectual protection we introduce Intellectual property protection index, obtained from The Global Competitiveness Report. It is scored from 1 denoting weak protection to 7, equal to the world's most stringent level of protection.

We use the Heritage Foundation Index of 'Freedom from Corruption' to measure the level of corruption. This indicator shows the perception of corruption in the business environment, including levels of governmental administrative, judicial and legal corruption (Beach and Kane 2008). The original index was transformed into odds with the same formula applied as for the business constraints variable with the highest value of the transformed indicator to denote the higher level of corruption.

Turning to finance, the availability of formal finance is defined as the ratio of domestic credit to private sector to GDP, obtained from the World Bank 'World Development' Indicators. This measure has been commonly used in previous studies (Klapper et al. 2006; Aidis et. al 2007). To capture the supply of informal funding we introduce the prevalence rate of informal institutional investors, derived on the basis of our GEM data by taking the average percentage of respondents who invested in someone else's start-up in the past three years in each country-year sub-sample.

Finally, we use the GEM-defined variables to represent business ownership. We capture social network effects by introducing a dummy variable which shows if the nascent entrepreneur knows other entrepreneurs.

¹¹ Here, to calculate odds we use the following formula: $[\text{Index} / (100 - \text{Index})]$.

3.3 Control variables

In addition to the institutional variables, the set of explanatory variables includes macroeconomic development indicators; foreign investment; tax burden and personal characteristics of entrepreneurs. We also replicate in full the large set of controls used by Bowen and De Clercq (2008) for comparability.

3.3.1 Macroeconomic Development Indicators

To capture the level of economic development and cyclical effects we introduce a measure of economic development proxied by per capita GDP (at purchasing power parity) and GDP annual growth rate (obtained from the World Bank World Development Indicators). The link between entrepreneurial activity and per capita GDP has been acknowledged by a number of scholars (Carree et al. 2002, Wennekers et al. 2005). As per capita GDP increases, the rate of entrepreneurial activity falls and that may be explained by the emergence of economies of scale. As income stability can be provided by large domestic firms, many individuals prefer employment to self-employment at this stage. However, entrepreneurial activity could surge again after passing a certain threshold in high-income countries, being affected positively by the accumulation of individual savings and economic environment favourable to exploitation of new opportunities. In our Heckman specification we also introduced per capita GDP squared within the selection equation to test this hypothesis of non-monotonicity, but we failed to provide any supporting evidence for this. We expect a positive relationship between per capita GDP and high-potential entrepreneurship, whereas it is likely to be negative for entrepreneurial entry, reflecting likely push effects in low income countries.

We also introduce the GDP annual growth rate variable to reflect a cyclical economic performance (see also Aidis et al. 2007). We expect that in a period of recession individuals are less likely to launch ambitious projects.

3.3.2 Foreign Direct Investment (FDI)

Similarly to Bowen and De Clercq (2008) we also introduce a control variable to denote foreign firms' presence. It is proxied by the stock of FDI

relative to GDP¹², obtained from the United Nations Conference on Trade and Development (UNCTAD). Prior research identifies various indirect transmission mechanisms through which FDI may affect domestic firms, including technological externalities, backward and forward linkages and competitive effects (Damijan *et al.* 2003; Navaretti and Venables 2004; Javorcik 2004). Entrepreneurship may serve as a mechanism through which a new idea or technology developed in other firms spills over to a new firm where it is commercialised (Audretsch and Thurik (2004), Cohen and Levinthal (1989)) and high-growth aspiration entrepreneurial ventures may be particularly affected. Some individuals may be keen on starting their own business after working for some time for large multinational firms (MNEs) and appropriating the knowledge developed within MNEs. Spillovers may occur through vertical linkages when established foreign companies subcontract for some intermediate jobs. As far as competitive effects are concerned, on the one hand FDI may increase competition in domestic markets by undermining the market position of domestic incumbent firms, on the other hand FDI may discourage entry of new start-ups (De Backer and Sleuwaegen 2003; Bowen and Clercq 2008). We hypothesise that FDI is more likely to have a positive effect on nascent entrepreneurs who are the unit of our observation in this study. Entrepreneurs lacking growth ambitions are more likely to be sensitive to competition from MNEs (negative effect), whereas, high-growth aspiration entrepreneurs are expected to benefit from FDI through the channels identified above.

3.3.3 *Tax Burden*

A burdensome tax system (Batra *et al.* 2003; Aidis and Mickiewicz 2006), and one that works against capital income and benefits debt financing relative to equity financing (Davidsson and Henrekson 2002), was identified as restraining firm growth. Accordingly, we expect that high tax burden may be negatively related to high-growth aspiration entrepreneurial activity and entrepreneurial entry overall. We use the Heritage Foundation 'Fiscal Freedom Index' that is calculated on the basis of both the tax burden in terms of the tax rate on individual and corporate income and the overall amount of tax revenue as a proportion of GDP

¹² Similarly to Bowen and De Clercq (2008) we use the stock rather than the flow of FDI to avoid possible correlation with other macro-level variables.

(Beach and Kane 2008). Again, we apply the logistic transformation to improve the distributional characteristics of this variable.

3.3.4 Transition Economy

Along with developed and developing economies, our sample includes transition economies, primarily of Central and Eastern Europe, but also Russia and China. After liberalisation, these economies faced an institutional vacuum as the old socialist system did not include institutions that support the market economy (Johnson et al. 2000; Estrin et al. 2006). Until the late 1980s, entrepreneurial activity was marginal¹³ or virtually non-existent (Smallbone and Welter 2001). Aidis et al. (2008a) find that the socialist heritage has been associated with a lower entrepreneurial entry in the post-socialist economies in early 2000s. While the transformation process has brought along attractive market opportunities allowing for pursuit of abnormal profits for entrepreneurs (McMillan and Woodruff 2002), it has also brought new obstacles for entrepreneurial activities, given the overall economic instability in the early transition and poorly developed legal infrastructure. While new businesses mushroomed in the early 1990s (Smallbone and Welter 2001; McMillan and Woodruff 2002; Aidis 2005), by the late 1990s most of transition economies began to experience a decline in the rate of new business creation. In turn, more stable conditions and a period of sustained high growth in early 2000s led to attractive entrepreneurial opportunities. As our sample time frame relate to the latter period, we hypothesise that being an economy in transition is positively related to high-growth aspiration entrepreneurship. We introduce a dummy variable to denote a transition economy.

We also include a set of various personal characteristics of entrepreneurs which are found to play an important role for entrepreneurial entry and their strategic choice.

¹³ In some Central European countries some limited forms of entrepreneurship (e.g. craft business in Poland or business work partnerships in Hungary) were legally allowed. Additionally, the Soviet block countries had extensive informal entrepreneurship.

3.3.5 Human capital

Previous GEM-based research shows that individuals with higher educational attainment are more likely to start a business (Minnitti et al. 2005b) and direct their efforts towards high-growth activities (Autio 2005). We use the GEM data on the age of individuals to construct two dummy variables, measuring first post-secondary and higher education jointly and second an incremental effect of higher education only.

3.3.6 Other personal characteristics of entrepreneurs

A number of research studies confirm that such socio-demographic features of entrepreneurs as age, gender and work status are significant determinants of entrepreneurial entry and decision-making. Previous GEM studies suggest that middle-aged persons are more likely to start a business (Reynolds et al. 1999; Minnitti et al. 2005b).

Entrepreneurial activity is found to vary significantly with gender. Being a male is more likely to drive up the rates of entrepreneurship (Minnitti et al. 2005a; see also: Grilo and Thurik, 2005).

We also introduce a dummy variable denoting some individual experience of being a business angel in the past that is expected to be positively associated with the use of external funding and the overall financial scale of the new project.

In addition, we include the ownership structure variable that identifies start-ups with more than one owner as the start-up level attributes. From the resource-based perspective, having business partners at the time of the start-up may have similar effects as being embedded in social networks. Additional business partners are likely to enrich social capital of the new venture.

Finally, to control for industry effects, we also include sectoral affiliation dummies.

3.3.8 Dependent variables

We utilize two dependent variables, both coded as dummies. The first one identifies a start-up activity as defined in Figure 1. It enters our selection equation. The second one measures high-growth aspiration entrepreneurship with 1 denoting those who have intentions to launch high-growth oriented projects. It enters the outcome equation within the Heckman specification.

{Figure 1 about here}

Tables 1-2 provide definitions of all explanatory and dependent variables respectively and report respective descriptive statistics.

{Tables 1 and 2 about here}

3.4 Methodology

In our empirical investigation we employ the Heckman probit-probit specification, which allows for simultaneous estimation of the probability of high-growth aspiration entrepreneurship and entrepreneurial entry, using a maximum likelihood method. The advantage of using the Heckman estimator is that it allows dealing with a sample selection using the full survey information. For the robustness of our results we also used simpler probit and ordered probit models; the results were consistent and are not reported.

The Heckman probit-probit specification consists of two parts: the outcome equation (1), identifying the binary choice of high-growth aspiration entrepreneurship, and the selection equation (2), describing the binary choice of entrepreneurship entry (Verbeek, 2000):

$$y_i^* = x_{1i}\beta_1 + \varepsilon_{1i} \quad (1)$$

Where y_i^* denotes an entrepreneur i 's choice to enter high-growth aspiration entrepreneurship and x_{1i} denotes a vector of exogenous factors (institutional factors, entrepreneurs' individual characteristics and other control variables). The choice of launching high-growth projects is not observed for individuals who do not enter entrepreneurship. We specify a second (selection) equation to describe whether an individual enters entrepreneurship or not:

$$z_i^* = x_{2i}\beta_2 + \varepsilon_{2i} \quad (2)$$

where the observation rule is as follows:

$$y_i = y_i^*, z_i = 1 \quad \text{if } z_i^* > 0 \quad (2.1)$$

$$y_i \text{ not observed, } z_i = 0 \quad \text{if } z_i^* \leq 0 \quad (2.2)$$

where y_i denotes an entrepreneur i 's choice to enter high-growth aspiration entrepreneurship. The Heckman specification reports the parameter, ρ , which shows the correlation between the two error terms. Provided it is statistically different from zero, the choice of a Heckman model is justified. Otherwise, both equations can be estimated independently by using other appropriate estimators. In our case the Wald test always rejects the null hypothesis of ρ equal to zero.

For the Heckman selection model, it is advantageous to distinguish the selection equation, by utilising a variable that is correlated with the first choice dependent variable (entrepreneurial entry), yet uncorrelated with the second choice dependent variable (high-growth aspirations) (Wooldridge 2002). For robustness, we utilised two alternatives. First, on theoretical grounds, regulatory entry barriers may be seen as sunk cost and should matter for entrepreneurial entry, yet not for the choice of subsequent growth strategies (Korosteleva and Mickiewicz 2008). The problem with this approach is that, as discussed above, we do not have a good measure of entry barriers. World Bank measures would be best, but do not correspond to our time frame and they vary considerably over time. The Heritage – Wall Street measure that we have captures not just entry regulations, but other aspects as well. Second, while existing theory and empirical results indicate that age is related to entrepreneurial entry, we are unaware of any theory linking age of entrepreneurs to the choice of growth strategies. Indeed, for our sample, the latter correlation is highly insignificant. Correspondingly, in this version, we base identification on age and age squared.

We performed econometric tests based on these two alternative identification strategies and found the results consistent. Our preference is for the second alternative and this is what is reported in the paper.

4. Empirical Results and Discussion

The correlation matrix for the institutional variables is presented in Table 3 and the Heckman model estimation results are in Table 4, with the high growth aspiration equation in Table 4a and the entrepreneurship equation in Table 4b. As noted above, we wish to include Property Rights, Intellectual Property Rights and Corruption as indicators of the strength of property rights. However, we note

in Table 3 that the three are highly correlated, as one would expect on theoretical grounds. We therefore include four specifications of the equations systems. In the first column we report the most general specification, with all three property rights variables included, and in columns 2 to 4, include each measure separately. Column 2 is therefore our preferred specification, and the other columns indicate the extent to which results are sensitive to specification of the property rights variable.

{Table 3-4}

We find that the Property Rights variable emerges as the most important determinant of high-growth aspiration entrepreneurship. The positive and statistically significant impact of the Heritage Foundation indicator is robust, as confirmed by the results of alternative specifications. This is consistent with part of Hypothesis 1. However, Table 4b shows that Property Rights do not influence entrepreneurial entry, which is not consistent with Hypothesis 1. The contrast between the results for entrepreneurial entry and for high-growth entrepreneurship may be explained by the fact that for low-scale ventures the new entrepreneurs may rely on informal institutions and localised trust to build self-efficacy necessary for successful entry. However, the larger-scale projects require more reliance on formal, impersonal institutions and the stability they may offer. Therefore, weak property rights become a binding constraint for entrepreneurial development. Weak protection of property rights affect negatively the motivation of entrepreneurs to expand their businesses: they start new ventures, however restrict themselves to small, subsistence scale projects.

The property rights indicator has no effect on entrepreneurial entry when it is examined jointly with high-growth aspiration entrepreneurship or when it is entered as the sole property rights indicator.¹⁴ Property rights and intellectual protection variables are highly correlated (see Table 3), so we drop the former from our specification to check the importance of intellectual property rights for high-growth aspiration entrepreneurship (Tables 4 (3) but still fail to identify any significant effects. Perhaps this is because, for more than half of our high-growth

¹⁴ Similarly, Korosteleva and Mickiewicz (2008) find that a property rights protection does not matter for entrepreneurial entry, whereas it is the dominant predictor for entrepreneurs' financing preferences.

aspiration entrepreneurs, the product or service they are offering is not seen as new. We speculate that high protection of intellectual property may be of a greater importance for high-technological firms and likely to gain more importance as an entrepreneurial firm grows towards building its own brand. Our results are consistent with those of Bowen and De Clercq (2008). Similarly, the corruption indicator, which can be seen as a related outcome variable resulting from weak protection of property rights, is not found to have any statistically significant impact on high-growth aspiration entrepreneurship, even when included as the only property rights variable (Table 4 (4)).

The data do not support Hypothesis 2, concerned with the relationship between the burdensome business regulation and high-growth aspiration entrepreneurship (Table 4a) or entrepreneurship (Table 4b). In case this finding is caused by collinearity, we perform a robustness check, replacing the Heritage Foundation business constraints measure with the number of start-up procedures (World Bank)¹⁵ but the results are not changed. This finding is consistent with some previous research (Aidis et al. 2007; Korosteleva and Mickiewicz 2008) and Bowen and De Clercq (2008) also find that regulatory complexity exerts no significant effects on high-growth entrepreneurial activity. One possible explanation for this is that expected high returns from the project are likely to outweigh the adverse impact of (initial) business constraints, which are mostly related to entry barriers. Moreover, business constraints may be irrelevant in the situation when an entrepreneur has a high level of social capital and learn from other entrepreneurs on how to by-pass these constraints. Consistent with Hypothesis 3a, our study reveals that the size of the formal financial sector is more conducive to high-growth aspiration entrepreneurship than to entrepreneurial entry. This result becomes more interesting when we consider the effects of the formal financial sector supply jointly with the prevalence of informal financing, Hypothesis 3b. The latter is found to play more significant role for entrepreneurial entry, whereas it has no impact, or even in some specifications a weak negative one, on high-growth aspiration entrepreneurship (Table 4a). We interpret these results as an indication that the entrepreneurs with high growth ambitions are more likely to rely on formal external financing, given

¹⁵ The results may be obtained from the authors upon request.

the larger scale of their projects. At the same time, their high growth potential can also be more attractive to external financiers making them more likely to finance a new venture. In contrast, informal financing may even be reduced when formal financing becomes available for formal financing for small projects.

Our study also confirms hypotheses 4 and 5. Thus there is a significant and positive impact of being an owner of any other existing businesses on high-growth entrepreneurship. This positive relationship between high-growth aspiration entrepreneurship and 'being an owner of established business' may suggest the existence of some important learning effects resulting in serial entrepreneurship. Consistent with H4, the effects of social capital are also captured through the variable representing the embeddedness in social networks as proxied by 'knowing other entrepreneurs' variable. These effects are consistently significant across all specifications employed in this study. We also find that a greater self-perceived risk aversion is likely to discourage high-growth entrepreneurial activity.

Controls largely follow expectations. We find that per capita GDP is negatively related to entrepreneurial entry indicating either growth opportunities related to development or 'push' factors, which matter more for entrepreneurial entry, but not for 'high growth' projects.

This interpretation is consistent with our result on the impact of GDP growth. Similarly, to the level of GDP, it has a robustly significant effect on entrepreneurial entry, but is insignificant in the 'high growth strategy' equation. This again suggests that the push factors are prominent in the decision to entry, but not in the decision of following high growth strategy. Hard times push individuals to start new ventures, but do not result in high growth strategies.

The tax burden is negatively and statistically significantly associated with entrepreneurial entry, but has no impact on high-growth aspiration entrepreneurship. This result is consistent with the view that high taxes and burdensome tax regulation are more costly for small firms (Winiecki, 2003), and become less of a problem for entrepreneurs who plan larger-scale ventures. The benefits from high-growth projects are likely to outweigh the costs associated with high tax and tax regulation burden.

Foreign firm presence, proxied by FDI, is positively related to high-growth aspiration entrepreneurship, while it has no significant effects for entrepreneurial entry. This implies that high-growth aspiration entrepreneurs are likely to benefit from FDI through various spillover effects discussed above.

Similarly, to Bowen and De Clercq 2008, our results also suggest the existence of a strong and positive effect of the transition factor on high-growth aspiration entrepreneurship, strengthening our earlier proposition that as countries progressed in transition, high-growth oriented entrepreneurs face a large number of potential higher-adding value projects. However, transition has no significant impact on entrepreneurial entry.

The results also show interesting patterns in terms of entrepreneurs' socio-demographic and other individual characteristics. Age is related to entrepreneurial entry. The relationship between age and entrepreneurial entry is quadratic with the likelihood of entering entrepreneurship is rising up to the point when entrepreneurs reach their middle age, and falling after that. The previous studies also find that middle-aged are more likely to enter entrepreneurship (Reynolds et al. 1999; Minniti et al. 2005b). Being in employment has positive impact on entrepreneurial entry but not on high-growth aspiration entrepreneurship. Similar effects relate to higher education. In turn, being male makes both entry and high-growth aspiration entrepreneurship more likely. Previous experience as business angel that can also serve as a proxy for accumulated own financial resources exerts positive effects on both entrepreneurial entry and on high-growth aspiration entrepreneurship, albeit the second is less robust. A number of perceptual and attitudinal variables characterising entrepreneurs are also important for entering high-growth aspiration entrepreneurship including the lack of fear of failure (H5) and the opportunity motive. Finally, consistent with our expectations we find that having more than one business partner increases the likelihood of entering high-growth aspiration entrepreneurship conforming to the resource-based view discussed earlier.

5. Conclusions

In our theoretical approach, we integrate institutional theory with modern theory of entrepreneurship, which stress the concept of self-efficacy and the importance of the characteristics of the cognitive focus of the individual. Accordingly, we argue that social experience, personal traits and institutional characteristics affect self-efficacy, which in turn affects both entrepreneurial entry and the choice of entrepreneurial strategies. This integrated approach may be seen as a novel aspect of our paper and our empirical results confirm that this theoretical advance is effective when applied to entrepreneurship.

The key message resulting from our findings is that more sophisticated institutions are correlated with more advanced forms of economic activity, represented in our case by high-growth aspiration entrepreneurship. The latter enhance efficiency and foster economic development. In particular, weak property rights do not prevent individuals from becoming entrepreneurs. However, they do discourage them from expanding their ventures and from hiring other people. Similarly, an underdeveloped financial system does not create a barrier to entrepreneurial entry: informal finance may substitute for small scale new ventures. However, without access to formal finance, high-growth project suffer and the entrepreneurs scale down their ambitions and expectations.

In this study we jointly investigated the effects of various institutional factors and entrepreneurs' individual characteristics on high-growth aspiration entrepreneurship and entrepreneurial entry. Our main findings can be summarized as follows. First, the property rights emerge as the most crucial institutional determinant of high-growth aspiration entrepreneurship, outweighing the effect of other variables, such as a narrower concept of intellectual property rights or corruption. At the same time, we fail to find any significant effects of the property rights on entrepreneurial entry, consistent with Korosteleva and Mickiewicz (2008).

Second, we find that the size of the formal financial sector has pronounced effects on high-growth aspiration entrepreneurship, as entrepreneurs with high growth ambitions are dependent on external formal financing. In contrast, availability of formal finance is insignificant in explaining entrepreneurial entry. We

find the opposite pattern for the size of the informal financing sector. Our study is novel in combining both aspects of entrepreneurial finance.

Third, our study reveals some important effects of social capital for high-growth aspiration entrepreneurship, suggesting that being embedded in social networks is likely to increase the likelihood of launching a high-growth oriented business.

Fourth, the importance of psychological traits is confirmed by the negative role of fear of failure (lack of self-efficacy) in affecting high-growth strategies. In contrast, individual regulatory focus cognitive strategies oriented on opportunity recognition result in high-growth entrepreneurship.

Finally, we find the importance of foreign investment for high-growth aspiration domestic entrepreneurship. This may have an important policy implication suggesting that authorities should encourage network linkages between large foreign and smaller domestic business. Similarly, the economy can benefit from encouraging the development network clusters involving small and multinational firms that will allow for knowledge transmission from MNEs to small firms, particularly those which have strong ambitions to grow, with further positive consequences for economic development.

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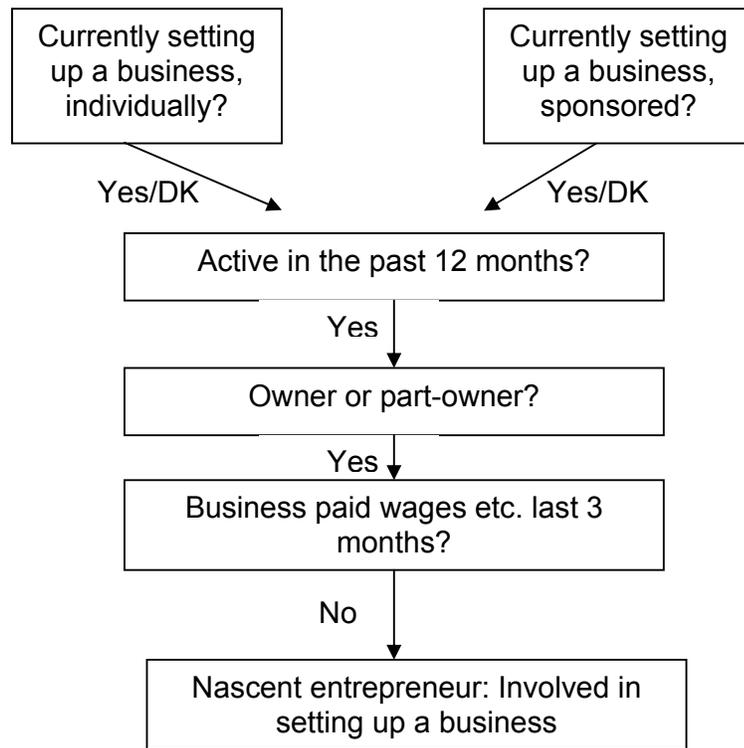
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Figure 1: GEM Classification of Nascent Entrepreneurial Activity (Startups)



**Table 1a: Descriptive statistics and definitions of explanatory variables:
Business environment & macroeconomic variables**

Variable	Definition	Mean	S.D.	No of obs.	Available for years
Property rights	Heritage Foundation 'Property Rights' index, transformed in odds [Index/(100-Index)]; higher value denotes stronger property rights	6.46	3.55	358,278	1998-2003
Intellectual Property Protection	Intellectual Property Protection index (Global Competitiveness Report); scores from 1="weak protection" to 7="strong protection"	5.32	1.04	358,278	1998-2003
Formal finance as % of GDP	Ratio of credit to private sector to GDP (WB WDI)	108.6	49.05	358,278	1998-2003
Informal finance prevalence	Informal investors prevalence	2.67	1.68	358,278	1998-2003
Business constraints	Heritage Foundation 'Business Freedom' index, transformed into odds [(100-Index)/Index]; higher value denotes higher entry barriers	0.34	.19	358,278	1998-2003
No of start-up procedures	Number of start-up procedures (WB)	7.42	3.49	358,278	1998-2003
Corruption	Heritage Foundation 'Freedom from Corruption' index, transformed into odds [(100-Index)/Index]; higher value denotes corruption			358,278	1998-2003
GDP per capita	GDP per capita at purchasing power parity, constant at 2000 \$USD (WB WDI 2008)	23,158.79	8,310.30	358,278	1998-2003
GDP growth	Annual GDP growth rate (WB WDI 2008)	2.52	2.54	358,278	1998-2003
FDI as % of GDP	FDI stock (UNCTAD) / GDP (WB WDI)	34.7	35.7	358,278	1998-2003
Fiscal Burden	Heritage Foundation 'Fiscal Freedom' Index, transformed into odds [(100-Index)/Index]; higher value denotes higher fiscal burden	.80	.51	358,278	1998-2003
Transition	1=transition economy, zero otherwise	.07	.26	358,278	1998-2003

**Table 1b: Descriptive statistics and definitions of explanatory variables:
Personal Characteristics**

Age	The exact age of the respondent between 14 and 99 at time of interview	43.87	17.00	326,487	1998; 2000-2003
Age squared	Age squared			326,487	
Male	1=male, zero otherwise	.47	.50	358,275	1998-2003
Employment	1=respondent is either in full or part time employment, 0 otherwise	.58	.49	317,649	1999-2003
Post-secondary & higher education	1=respondent has a post secondary or higher education attainment, 0 otherwise	.65	.48	347,746	1999-2003
Higher education	1=respondent has a higher education attainment	.29	.46	347,746	1999-2003
Current owner of business	1=current owner/manager of business, 0 otherwise	.05	.22	342839	2000-2003
Business angel	1=business angel in past three years, 0 otherwise	.03	.16	357,773	1998-2003
Fear of failure	1=respondent has shut down business in past 12 month, 0 otherwise	.31	.46	299,674	2000-2003
Knows other entrepreneurs	1=personally knows entrepreneurs in past two years, zero otherwise	.33	.47	299,682	2000-2003
Opportunity motivation	1=nascent entrepreneur is driven by an opportunity motive, zero otherwise	.75	.43	10,081	2002-2003
Opportunity recognition	1=respondent believes there are local opportunities for entrepreneurship	.25	.43	314,444	1998-2003
Self-confidence	1=respondent believes that has the knowledge, skill and experience required to start a business	.39	.49	262,508	2001-2003
More than one owner	1=start-up has more than one owner, zero otherwise	.44	.50	18,828	2000-2003

Source: GEM 1998-2003 unless specified otherwise

Table 2: Descriptive statistics and definitions of dependent variables

Variable	Definition	Mean	S.D.	No of obs	Available for years
Nascent entrepreneurship	1=respondent is engaged in startup activity, zero otherwise	.034	.18	342,839	2000-2003
High-growth aspiration entrepreneurship	1= high-growth aspiration entrepreneurship, zero otherwise	.28	.45	9,657	2000-2003

Source: GEM 1998-2003 unless specified otherwise

Table 3: Correlation matrix for institutional variables

	Property rights	Intellectual property protection	Corruption	Business constraints	No of start-up procedures	Formal finance as % of GDP	Informal finance prevalence	Fiscal burden	FDI as % of GDP	GDP per capita	GDP growth
Property rights	1.00										
Intellectual property protection	.76	1.00									
Corruption	-.72	-.84	1.00								
Business constraints	-.59	-.59	.68	1.00							
No of start-up procedures	-.66	-.68	.73	.54	1.00						
Formal finance as % of GDP	.52	.65	-.55	-.49	-.40	1.00					
Informal finance prevalence	.12	.01	.07	.12	-.07	.12	1.00				
Fiscal burden	.21	.38	-.34	.02	-.32	-.02	-.08	1.00			
FDI as % of GDP	.23	.05	-.21	-.35	-.22	.07	-.12	-.08	1.00		
GDP per capita	.76	.79	-.80	-.61	-.69	.60	.04	.36	.13	1.00	
GDP growth	-.10	-.10	.09	.05	-.07	-.00	.12	-.12	.06	-.15	1.00

Source: GEM 1998-2003

Table 4a: Heckman probit-probit estimation results

	(1) Coeff. (Robust s.e.)	(2) Coeff. (Robust s.e.)	(3) Coeff. (Robust s.e.)	(4) Coeff. (Robust s.e.)	(5) Coeff. (Robust s.e.)
Outcome equation, dependent variable: High-growth aspiration entrepreneurship					
Male	.203 ^a (.059)	.200 ^a (.061)	.217 ^a (.059)	.209 ^a (.061)	.224 ^a (.054)
Employment	-.027 (.061)	-.022 (.064)	-.018 (.065)	-.030 (.064)	-.004 (.067)
Post-secondary & higher education	.044 (.056)	.047 (.054)	.052 (.054)	.059 (.057)	.058 (.056)
Higher education	.040 (.052)	.039 (.052)	.051 (.056)	.048 (.057)	.064 (.055)
Current owner of business	.098 ^d (.052)	.100 ^d (.053)	.103 ^d (.054)	.109 ^c (.054)	.097 ^d (.056)
Business angel	.127 (.101)	.120 (.103)	.145 (.099)	.132 (.103)	.174 ^d (.092)
Knows other entrepreneurs	.148 ^a (.038)	.147 ^a (.037)	.173 ^a (.039)	.169 ^a (.041)	.176 ^a (.041)
Fear of failure	-.102 ^c (.045)	-.101 ^c (.045)	-.105 ^c (.047)	-.102 ^a (.046)	-.109 ^c (.047)
Opportunity recognition	-.018 (.038)	-.017 (.038)	-.016 (.038)	-.014 (.037)	-.012 (.039)
Self-confidence	.051 (.051)	.050 (.050)	.044 (.051)	.044 (.051)	.042 (.052)
Opportunity motivation	.201 ^a (.052)	.199 ^a (.089)	.185 ^a (.053)	.182 ^a (.053)	.190 ^a (.053)
More than one owner	.457 ^a (.046)	.453 ^a (.048)	.462 ^a (.046)	.451 ^a (.047)	.465 ^a (.044)
GDP per capita	-.000 (.000)	-.000 (.000)	-.000 (.000)	-.000 (.000)	-.000 (.000)
GDP growth	-.001 (.013)	-.001 (.013)	.000 (.013)	-.000 (.012)	-.000 (.012)
Business constraints	.014 (.214)	.051 (.194)	-.102 (.209)	-	-
Property rights	.053 ^c (.024)	.049 ^b (.019)	-	-	-
Intellectual property protection	-.037 (.064)	-.040 (.063)	-.030 (.078)	-	-
Corruption	.052 (.087)	-	-	-.073 (.060)	-
Formal finance / GDP	.002 ^d (.001)	.002 ^d (.001)	.001 ^d (.001)	0.002 ^d (.001)	.002 ^c (.001)
Transition	.629 ^a (.191)	.621 ^a (.188)	.526 ^b (.183)	.512 ^b (.169)	.503 ^b (.162)
Fiscal burden	.036 (.075)	.028 (.077)	.027 (.083)	-.022 (.071)	.047 (.078)
FDI as % of GDP	.001 (.001)	.001 (.001)	.002 ^d (.001)	.002 ^c (.001)	.002 ^b (.001)
Informal finance prevalence	-.039 ^d (.021)	-.035 ^c (.018)	-.026 (.019)	-.020 (.020)	-.023 (.022)
No of start-up procedures	-	-	-	-	.021 (.016)
Constant	-7.769 (.526)	-6.444 (.499)	-9.935 (.516)	-7.721 (.547)	-14.43 ^b (.509)

Table 4b: Heckman probit-probit estimation results

Selection equation; dependent variable: entrepreneurship					
	(1) Coeff. (Robust s.e.)	(2) Coeff. (Robust s.e.)	(3) Coeff. (Robust s.e.)	(4) Coeff. (Robust s.e.)	(5) Coeff. (Robust s.e.)
Age	.015 ^b (.006)	.015 ^b (.005)	.015 ^b (.005)	.016 ^b (.005)	.016 ^b (.006)
Age squared	-.000 ^a (.000)	-.000 ^a (.000)	-.003 ^a (.000)	-.000 ^a (.000)	-.000 ^a (.000)
Male	.249 ^a (.020)	.249 ^a (.021)	.249 ^a (.021)	.250 ^a (.020)	.254 ^a (.020)
Employment	.244 ^a (.033)	.248 ^a (.035)	.249 ^a (.034)	.245 ^a (.033)	.243 ^a (.041)
Post-secondary & higher education	.037(.036)	.031(.036)	.035(.036)	.041(.037)	.040(.066)
Higher education	.133 ^a (.025)	.132 ^a (.026)	.132 ^a (.025)	.139 ^a (.025)	.132 ^a (.035)
Current owner of business	.044(.044)	.042(.045)	.041(.045)	.043(.045)	.045(.044)
Business angel	.552 ^a (.031)	.553 ^a (.031)	.555 ^a (.031)	.553 ^a (.030)	.553 ^a (.032)
GDP per capita	-.000 ^c (.000)	-.000 ^c (.000)	-.000 ^d (.000)	-.000 ^b (.000)	-.000 ^c (.000)
GDP growth	-.040 ^a (.010)	-.039 ^a (.009)	-.038 ^a (.009)	-.043 ^a (.011)	-.046 ^c (.023)
Business constraints	.026(.203)	-.034(.199)	-.075(.199)	-.181 ^a (.039)	-
Property rights	.012(.014)	.017(.013)	-	-	-
Intellectual Property Protection	-.128(.050)	-0.114 ^c (.055)	-.087(.051)	-	-
Corruption	-.092(.067)	-	-	-.054(.068)	-
Formal finance / GDP	.001(.001)	.001(.001)	.001(.001)	.000(.001)	.000(.002)
Transition	-.183(.113)	-.177(.118)	-.196 ^d (.110)	-.142(.098)	-.160(.195)
Fiscal burden	-.114 ^c (.056)	-.099 ^d (.056)	-.103 ^d (.056)	-.156 ^b (.055)	-.169(.108)
FDI as % of GDP	.001(.001)	.001(.001)	.000(.001)	.001(.001)	.001(.001)
Informal finance prevalence	.091 ^a (.019)	.083 ^a (.017)	.085 ^a (.017)	.086 ^a (.017)	.080 ^b (.027)
No of start-up procedures	-	-	-	-	-.023(.024)
Constant	-1.77 ^a (.211)	-1.96 ^a (.219)	-2.02 ^a (.225)	-2.18 ^a (.210)	-1.94 ^a (.464)
No of censored obs.	283,751	283,751	283,751	283,751	283,751
No of uncensored obs.	6,057	6,057	6,057	6,057	6,057
rho (coef.)	-.362(.152)	-.374(.157)	-.327(.157)	-.352(.159)	-.279(.146)
Wald chi2 (21) (rho=0)	4.72 (p-value=.029)	4.64 (p-value=.031)	3.72 (p-value=.053)	4.07 (p-value=.044)	3.25 (p-value=.071)
Wald chi2	655.63	589.54	556.38	532.64	568.21

Note: ^a significant at 0.001; ^b significant at 0.01; ^c significant at 0.05; ^d significant at 0.1