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REGIONAL POPULATION DENSITY AND ENTREPRENEURIAL GROWTH ASPIRATIONS: THE MODERATING ROLE OF INDIVIDUAL HUMAN CAPITAL

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Abstract

We build on different theoretical perspectives to investigate the unique and joint effects of population density and nascent entrepreneurs' human capital endowments (higher education, entrepreneurship training and owner-manager experience) on entrepreneurial growth aspirations. We test a number of hypotheses using data that combine individual and province level information in Spain over the period 2008-2010. We argue that growth aspirations of nascent entrepreneurs are higher in more densely populated regions, but that such environmental influence is stronger for individuals with greater human capital. This is because they will be more aware that denser regions offer more favorable

conditions for new businesses and also requires greater firm growth to compensate for a higher risk of business failure. Consistent with our view, we find that the growth aspirations of nascent entrepreneurs with higher education and with owner-manager experience are higher in densely populated provinces.

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ABSTRACT

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Keywords: entrepreneurship, growth aspirations, human capital, population density.

INTRODUCTION

Entrepreneurs' aspirations to grow capture the individuals' beliefs or conjectures about the growth potential of their ventures and are a reflection of their own motivations for running the business (Levie and Autio, 2013)¹. Previous research on entrepreneurial growth aspirations has shown a positive effect of growth aspirations upon subsequent real growth (Baum et al., 2001; Wiklund and Shepherd, 2003; Davidsson et al., 2006), which has led to an increasing interest in the antecedents of such aspirations. Recent evidence shows that both external conditions and entrepreneur's background have an impact on the formation of growth aspirations (Acs and Autio, 2010; Estrin et al, 2013). However, there is a need to better understand the combined influence of environmental conditions, particularly the immediate context of the new firm, and individual characteristics related to the entrepreneur.

This lack of knowledge is fairly surprising because entrepreneurship is the outcome of the interplay between environmental conditions and individual attributes (Shane, 2003; Shane and Venkataram, 2000; Capelleras et al., 2014; Grichnik et al., 2014). In this sense, Davidsson (1991) points out that "objective" regional conditions have an impact on cognitive processes, which, in turn, would impact entrepreneurial growth aspirations. The present study contributes to the emerging literature on entrepreneurial growth aspirations formation by analyzing the joint effect of environmental conditions and individual characteristics. In this vein, we seek to further understand the interplay between the individual characteristics of the entrepreneur and his/her surrounding environment. We develop a framework to investigate the unique and joint effects of population density and entrepreneurs' human capital on growth aspirations of nascent entrepreneurs. The framework is based on insights from the regional entrepreneurship literature, together with the judgment-based approach to entrepreneurship, the entrepreneurial cognition framework and human capital theory.

We first argue that the immediate context where the firm is created, particularly the regional environment of the new business, will affect entrepreneurial growth aspirations. The role of the regional context in entrepreneurial activity is acknowledged in the entrepreneurship and economic geography literatures (e.g. Malecki, 1997; Trettin and Welter, 2011). While a number of regional variables have been shown to affect entrepreneurship, we focus on the

¹ While researchers have used terms such as "growth intentions", "growth ambitions" or "growth aspirations" interchangeably (Levie and Autio, 2013), we follow recent studies in this area and use the term entrepreneurial growth aspirations (e.g. Autio and Acs, 2010; Estrin et al, 2013).

level of population density. Population density determines both the opportunity structure (on the demand side) and the resources and abilities of individuals and their attitudes toward entrepreneurship (on the supply side). Hence, it captures features of the environment that are central to understand entrepreneurial behavior and, thus, growth aspirations of nascent entrepreneurs. Greater population density stimulates the creation of new firms due to a relatively-high number of entrepreneurial opportunities to be discovered and exploited (Ucbasaran et al., 2008; Dencker et al., 2009; Dencker and Gruber, 2014), but, at the same time, enhances competition, which may lead to high business failure rates (Bosma et al, 2008; Kibler et al., 2014; Löf and Nabavi, 2015). In these conditions prospective entrepreneurs will require a greater performance threshold to their ventures. It follows that the growth aspirations of the nascent entrepreneurs in these regions will be higher.

Secondly, drawing on the notion that “objective” characteristics of the regional environment (Kibler, 2013) and human capital interact in shaping entrepreneurial growth aspirations, we examine how population density and the founder’s knowledge endowments jointly affect entrepreneurial growth aspirations. We argue that the relationship between population density and aspirations will be moderated by the entrepreneurs’ human capital. Human capital gained through formal educational processes or experience allows nascent entrepreneurs to better gauge the opportunities and threats of the surrounding environment. At the same time, greater human capital increases nascent entrepreneurs’ self-efficacy (Autio and Acs, 2010). All together leads us to expect that growth aspirations in regions with greater population density will be higher for those nascent entrepreneurs with bigger endowments of human capital.

Our empirical analysis is based on a sample of 643 of nascent entrepreneurs in Spain. We concur with the definition provided by the Global Entrepreneurship Monitor (GEM) project and define a nascent as an individual who has launched an enterprise that is less than 3 months old. Our choice of nascent entrepreneurs is based on the interest for exploring growing aspirations when those intentions are emerging (Douglas, 2013). Specifically, our data set combines individual-level information obtained from the GEM project in Spain with province-level information gathered from the Spanish Statistics Institute during a recessive period (2008-2010). A multilevel analysis is employed for testing the hypotheses. Results confirm that growth aspirations of nascent entrepreneurs are higher in densely populated provinces and that in these provinces growth aspirations increase with higher education and with owner-manager experience.

The rest of the paper is organized as follows. First, we develop and justify four testable hypotheses. Second, we describe the data, variables and methods. Third, we present the results of our empirical analysis. To conclude, we discuss the implications of the findings.

HYPOTHESIS DEVELOPMENT

Population density and entrepreneurial growth aspirations

Individual development and behavior take place in a certain location and in an environment that is partly region specific (Fritsch and Storey, 2014). Entrepreneurs have a strong tendency to locate their businesses close to their place of residence (Figueiro et al., 2002, Dahl and Sorenson, 2009), which indicates that firm founders will be strongly influenced by the regional context where they live. In this sense, researchers have shown that regional factors affect individual decisions in the entrepreneurial process (Mueller et al., 2008). Studies in the economic geography literature have found that factors such as population growth (Fritsch and Storey, 2014; Reynolds et al., 1994), regional share of labor force employed in small businesses (Fritsch, 1997) and unemployment rates (Bosma and Schutjens, 2011) relate to new firm formation rates.

The conditions of the immediate environment surrounding the entrepreneur, such as economic, demographic and physical features that constitute the regional context, are likely to shape aspirations (Kibler et al., 2014). In effect, regions differ in their availability of resources and opportunities (Stam et al., 2012), and individuals will encounter regional environments that are more or less benevolent and munificent when aiming to become an ambitious entrepreneur. Hence, depending on the environmental conditions, individuals may aspire to different degrees of growth for their new businesses. However, evidence on the regional influences on entrepreneurial growth aspirations is still scarce.

In this study, we focus on the regional level of population density as a potential determinant of entrepreneurial growth aspirations. Population density has been linked with greater new business formation rates. In general, highly dense regions show more local market opportunities related to the consumer market and necessary inputs (Tödting and Wanzenböck, 2003; Wagner and Sternberg, 2004) than less dense regions (e.g. Reynolds et al, 1994; Armington and Acs 2002), which facilitates the entry of new firms. Moreover, densely populated regions are often characterized by a more diverse population and more variety in

demand, which stimulates new firm start-ups (Bosma et al., 2008; Frenken and Bloschma, 2007). In addition, conditions for entering a market are thought to be more favorable in more densely populated regions (Audretsch and Fritsch, 1994) because of closer proximity to the consumer market, the more developed business infrastructure and the presence of a more skilled workforce. Networking and collaboration with potential customers, suppliers and other organizations are also more likely to occur in regions with a higher population density (Liao and Welsch, 2005; Kibler et al, 2014). All these effects together will stimulate the creation of new firms in densely populated regions. However, these regions can also undermine entrepreneurial activities, mainly because of intense competition, high barriers to entry and less room for product differentiation (Bosma et al, 2008; Kibler et al, 2014). Nevertheless, as Fritsch and Storey (2014) point out there is a clear evidence of a positive impact of population density, and in general effects of urbanization/agglomeration, on both service and manufacturing new business formation rates.

In continuing with this line of work, we argue that population density not only affects new firm formation rates, but that it also influences entrepreneurial growth aspirations. The access to a greater and more diverse potential demand, the availability of resources or the greater opportunity for networking that are associated with more densely populated regions, constitute an environment that opens opportunities for business growth. However, it also should be acknowledged that business failure rates are higher in regions with greater population density. Strong competition in these densely populated regions (Bosma et al, 2008; Kibler et al, 2014) may lead to relatively high business failure rates (Löf and Nabavi, 2015). This will increase the perceived risk of business failure by entrepreneurs. As a result, individuals from highly populated regions will require higher performance threshold when thinking about the possibility of setting up a new firm. Consequently, these entrepreneurs will have higher growth aspirations than entrepreneurs from less dense regions to compensate for a higher business failure risk.

Overall, we argue that greater regional population density will have a positive impact on entrepreneurial growth aspirations due to the expected higher growth potential of businesses in these regions and the required higher performance threshold. Accordingly, we formulate the following hypothesis concerning the relationship between growth aspirations and regional population density;

Hypothesis 1: Entrepreneurial growth aspirations are positively correlated with population density.

The moderating role of human capital

We have argued that the regional context, and more specifically the population density of the region, will have an impact on entrepreneurial growth aspirations. We now build upon previous literature on human capital (Becker, 1964), entrepreneurial cognition (Mitchell et al., 2002) and the judgment approach to entrepreneurship (e.g. Knight, 1921; Mises, 1949) to propose that this effect is likely to vary with the human capital endowments of the entrepreneur. The judgment approach views entrepreneurs as decision makers who invest resources based on the judgment of future conditions. Entrepreneurs' judgmental decisions are actually grounded on beliefs or conjectures about the future, which, we argue, are likely to be influenced by their human capital.

Following Becker (1964), we define human capital as knowledge and skills that individual acquire through investments in education, on-the-job training or other types of experience². According to Mitchell et al (2002:97), "entrepreneurial cognitions are the knowledge structures that people use to make assessments, judgments, or decisions involving opportunity evaluation, venture creation, and growth". Thus, entrepreneurial cognition has to do with "how entrepreneurs use mental models to piece together unconnected information that may help them to assemble the necessary resources to launch and grow their businesses" (Mitchell et al., 2002:97). In other words, entrepreneurial cognitions link the knowledge and skill endowments that made up human capital with entrepreneurial judgment, defined as the act of evaluating opportunities and deciding which resources need to be assembled and how they need to be combined, to capitalize on entrepreneurial opportunities (Foss and Klein, 2012).

Since entrepreneurial cognitions are shaped by human capital, and judgment is an integral part of those entrepreneurial cognitions, it follows that entrepreneurs' understanding and conjectures about the existence of opportunities and threats in the environment, and ultimately about the future prospects of the new venture are likely to be affected by their human capital.

² Human capital attributes -including education, experience, knowledge, and skills- have been argued to be a critical resource for entrepreneurial success (e.g. Florin et al., 2003; Pfeffer, 1994; Sexton and Upton, 1985) and empirical evidence has well established this positive relationship (Unger et al., 2011). In addition, previous evidence has shown that human capital, in particular higher education, also has a positive impact on the aspirations of nascent entrepreneurs (Autio and Acs, 2010; Stam et al, 2012).

Through both work experience and the different educational processes individuals gain knowledge and build mental frames and models they use to interpret and make sense of the reality that surrounds them (Mitchell et al, 2002). Education and experience influence how the entrepreneurs perceive the environment and thus affect opportunity identification and assessment and, ultimately, growth aspirations. Because human capital influences entrepreneurial cognitions and judgment, it affects the way individuals perceive and understand the environment that surrounds them. In this vein, human capital will shape entrepreneurs' beliefs or conjectures about the growth potential of their firms (i.e. growth aspirations) in a given regional context. That is, entrepreneurs, will interpret the signals sent by the regional context differently, depending on their level of human capital. Hence, we expect to observe differences in the growth aspirations of entrepreneurs within a given regional context as a function of their human capital endowments. In particular, the growth aspirations of entrepreneurs in densely populated regions will vary as a function of their human capital.

In this paper we distinguish and consider the following endowments of human capital: higher education, entrepreneurship training and owner-manager experience. Entrepreneurs with higher education are expected to embrace more ambitious growth targets or reduce initial expectations in line with regional conditions (Dutta and Thornhill, 2008). As stated previously, higher business failure risk in regions with greater population density, due mainly to greater competition, leads entrepreneurs to require a higher performance threshold and, therefore, to have higher growth aspiration. Entrepreneurs with higher education, compared with those without such education, will possess more technical as well as general knowledge base, that would vest them with better capacity to gather, process and analyze relevant information (Forbes, 2005a; Kim *et al.*, 2006; Capelleras and Greene, 2008). In addition, the knowledge gained through higher education may allow nascent entrepreneurs to better understand the consequences of their decisions. Highly educated individuals may also have access to a large and resource-rich network of contacts (Batjargal, 2003; Capelleras et al, 2010), which may favor their awareness of the changes in the local environment, including the recognition and exploitation of opportunities (Kibler et al, 2014). Hence, nascent entrepreneurs with higher education will be more aware of the advantages and disadvantages of densely populated regions, and therefore will be more likely to recognize that greater growth is required in denser regions and to demand higher growth rates, and consequently, have higher growth aspirations.

Also, previous research has noted (Autio and Acs, 2010) that the opportunity cost of being involved in entrepreneurial activities is higher for individuals with higher education because of their better job market prospects. Accordingly, nascent entrepreneurs with higher education will ask higher growth potential to their ventures and will show higher growth aspirations. This situation is exacerbated in densely populated regions, since employment opportunities are usually also better in those regions (Armington and Acs, 2002; Bosma and Sternberg, 2014). But entrepreneurs with higher education also rate higher on self-efficacy (Autio and Acs, 2010). This will lead them to perceive that they are able to capitalize on the greater growth opportunities that are often associated with more densely populated regions (Bosma et al., 2008).

In sum, highly educated entrepreneurs in highly dense regions are expected to have higher growth aspirations than those entrepreneurs without higher education in the same dense regions. The following hypothesis summarizes this expectation:

Hypothesis 2: The relationship between growth aspirations and population density varies with the educational level of the entrepreneur, such that the growth aspirations of entrepreneurs in more densely populated provinces are higher for those with higher education.

Individuals having received training in entrepreneurship will also show greater growth aspirations in more densely populated regions. Entrepreneurship training focuses mainly on “the identifications of opportunities” (DeTienne and Chandler, 2004; Fiet and Barney, 2002). In fact, certain skills related to identifying highly credible opportunities can be identified and taught (Fiet and Barney, 2002). Some evidence suggests that individuals who have received entrepreneurship training are more likely to undertake opportunity identification tasks than those who have not received such training (DeTienne and Chandler, 2004). In other words, individuals can learn opportunity-seeking processes through the avenue of entrepreneurship training, thereby improving both the number of ideas generated and the innovativeness of those ideas.

We suggest that this focus on opportunities may affect an individual’s understanding of their surrounding environment. Then, similar to the case of entrepreneurs with higher education, entrepreneurs who have received entrepreneurship training will be more aware about the

better growth potential in regions with higher population density, but also that greater growth is required in these regions to overcome the greater failure rates. It follows that those individuals who, being aware of the opportunities and risks associated with new ventures in these regions, decide to create a new firm will demand higher growth rates, and consequently have higher growth aspirations. Also, the learning process in the training programs will lead to greater self-efficacy through vicarious learning. Self-efficacy is likely to have a positive impact on the nascent entrepreneurs' beliefs about their chances to take advantage of the growth opportunities available in regions with greater population density (Autio and Acs, 2010).

We therefore expect that entrepreneurs who have received entrepreneurship training and who are located in regions with greater population density, will hold higher growth aspirations than those entrepreneurs without such entrepreneurship training located in the same dense regions. Based on these considerations, we suggest the following hypothesis:

Hypothesis 3. The relationship between growth aspirations and population density varies with the entrepreneurship training, such that the growth aspirations of entrepreneurs in more densely populated provinces are higher for those with entrepreneurship training.

Entrepreneurs who are owners or managers of an existing business will also have higher growth aspirations in regions with greater population density. New firms suffer from the liability of newness, which refers to a higher propensity to fail as compared to established firms (Aldrich and Wiedenmayer, 1993; Stinchcombe, 1965). The liability of newness is partially due to skill gaps and lack of information. Therefore, human capital in general, and individual's owner-manager experience in particular, would contribute to reduce or eliminate it (Aldrich and Auster, 1986).

Entrepreneurs with previous manager-owner experience have a "track record", as well as routines and established practices that will able them to obviate the liability of newness and to have a good understanding of the surrounding environment. It follows that entrepreneurs with prior owner-manager experience are more likely to recognize that greater growth is required in denser regions. In addition, past owner-manager experience is likely to increase self-efficacy through enactive mastery, which in turn will translate into greater confidence about the possibilities to make the most of the growth opportunities available in regions with greater

population density. Consequently, we expect entrepreneurs with prior owner-manager experience located in more densely populated regions to have higher growth aspirations than those entrepreneurs without that experience located in the same dense regions. The following hypothesis summarizes this expectation:

Hypothesis 4. The relationship between growth aspirations and population density varies with the entrepreneur's prior owner-manager experience, such that the growth aspirations of entrepreneurs in more densely populated provinces are higher for those with prior owner-manager experience.

Figure 1 visually summarizes the conceptual model of the study.

----- Insert Figure 1 about here -----

METHODS

Data collection and sample

In order to test our hypotheses we use two levels of analysis i.e. individual and regional levels. In particular, our empirical model combines primary data for individuals and secondary data for province-level information in Spain. This model is based in cross-sectional database structure lacking in the field of entrepreneurship longitudinal dataset available to study entrepreneurial behavior (Stuetzer et al., 2014). The analysis covers the years 2008, 2009 and 2010, which are considered a recessive period for the Spanish economy.

Individual observations are obtained from the Adult Population Survey (APS) of the Spanish GEM project, which allows us to account for the characteristics of those entrepreneurs in the process of starting up and managing a new business (Reynolds *et al.*, 2005). The APS is designed to obtain a representative sample of the Spanish population aged 18 to 64. From the original APS database we selected those observations corresponding to nascent entrepreneurs. A nascent entrepreneur is defined as an individual who has taken some actions in the past year to create a venture, who expects to own at least a share of the new firm and who has not paid salaries, wages or any other payments to the owners for more than three months (Reynolds *et al.*, 2005; Stuetzer et al., 2014). At such an early stage, their declared expectations are not influenced by the evolution of business performance in the past, but are mostly shaped by the individual's beliefs about the potential of the business opportunity she identified. After

cleaning missing values and non-valid answers the sample comprises 643 nascent entrepreneurs.

Regional variables were collected mainly from the Spanish Statistics Institute (*Instituto Nacional de Estadística*, INE) at province level. The Spanish territory is divided into 52 provinces, which are the second-level territorial and administrative divisions and correspond to NUTS 3 according to EUROSTAT. We are confident with the variables gathered from INE; they will properly capture the regional characteristics in our study. In order to avoid endogeneity concerns we use the change in the population rate and the unemployment rate variables to avoid volatility among years.

Variable measurement

Dependent variable. As per our conceptual model the dependent variable is *entrepreneurial growth aspirations*. Following previous studies (e.g. Estrin et al., 2013) we calculate entrepreneurs' growth aspirations as the difference between the natural logarithms of the entrepreneurs' expected number of employees in the next five years and the real number of employees (not counting the owners) at business inception.

Independent variables. Consistent with our hypotheses we use the following independent variables. At the regional level, we measure *population density* as the number of inhabitants per km² in each province. This variable is used to test hypothesis 1 and is computed in thousands for presentation purposes. At the individual level, we consider *higher education* captured through a dummy variable taking the value 1 if the entrepreneur has post-secondary (university degree) education and 0 otherwise. *Entrepreneurship training* is measured through a dummy variable that takes value 1 if the entrepreneur has received some training activities related to starting an enterprise and 0 otherwise. Finally, *owner-manager of existing business* takes value 1 when the nascent entrepreneur is the owner or manager of an existing business. To test hypotheses 2, 3 and 4 we create the following three interaction variables: *population density x higher education*; *population density x entrepreneurship training* and *population density x owner-manager of existing business*.

Control variables. We control for several individual and regional level variables. At the individual level, we first include entrepreneur's *age* in years and *gender* (1 male and 0

female). *Opportunity perception* measures to some extent the optimism of the entrepreneur (Cassar, 2010). Specifically, this is a dummy variable that takes the value 1 if the entrepreneur perceived good founding opportunities to start up a business in the next six months in the area where she lives in. We also control for *fear of failure*, which is variable that measures whether that feeling would slow entrepreneur down to start-up a business. Immigrants present lower levels of socio-cultural fit (Contín-Pilart & Larraza-Kintana, 2014) which influences their understanding of the environment, and therefore may potentially influence their aspirations. Hence, *Spanish nationality* takes value 1 if the entrepreneur was born in Spain and 0 if born abroad. *Know personally an entrepreneur* is a binary variable that measures 1 if the entrepreneur knew personally someone who had started a business within the last 2 years. We also control for *family size* measured in terms of the number of family members in the entrepreneurs' household, and also included the variable *necessity entrepreneurship*, which is a dummy variable that takes value 1 if the business was created by necessity and 0 if it was as a consequence of opportunity motivation. *Manufacturing* variable controls for industry differences in growth potential and therefore aspirations. That variable takes value 1 if the new business is in extractive or transforming sectors and 0 if it is in business service or consumer-oriented ones. Finally, we include time dummies (Stuetzer et al., 2014) to control by the *years* of the pool (excluding one as a reference category, in this case 2008).

At the regional level, we control for three variables. The *annual unemployment rate change* is measured in terms of the change experienced in the average unemployment rate from year t-1 to year t. Since unemployment rates (in percentage) per province are published each three months, yearly average unemployment rate is computed as the average of the four quarters of each year and expressed in percentage units for presentation purposes. The *annual population change* is measured using the absolute number of inhabitants of each province per year. As in the case of unemployment rates the change is measured relative to the previous year in percentage. Finally, the *GDP/h* is defined in terms of the Gross Domestic Product per-capita in each province and calculated in thousands for presentation purposes.

Methodological approach

The nature of our dataset is based in a pooled cross-sectional time series structure where individuals are hierarchically grouped by province. In this vein, if we were reducing the design just to a single-level of analysis it would mean to consider individuals acting

homogenously not taking into account the effect of the environment in their decisions (Autio and Wennberg, 2010). For this reason, we use a multilevel analysis approach (e.g. Autio and Wennberg, 2010; Bosma and Sternberg, 2014; Stuetzer et al., 2014). Since our dependent variable is the difference between logarithms (see the previous section), we apply multilevel mixed-effects linear regression model for continuous responses which assumes the overall error to be Gaussian distributed. In this case, heteroscedasticity and correlations within the lowest-level groups may also be modeled. Fixed-effects in the analysis are the coefficients at individual-level and the constant term. In the second-level of analysis, we add the group variable, *province* capturing random-effects components. In short, mixed-effects regression models allow one to use data where (1) individuals change across time (2) there are different number of observations per subject and (3) time can be continuous.

Furthermore, in the last part of the analysis looking at the fixed-effects components, we allow the intercept and the slope to vary across regions. As we are interested to test cross-level moderation effects, the random-effects in the multilevel analysis allows non-standardized coefficients and intercept to vary across regions (Martin et al., 2007; Autio and Wennberg, 2010).

There are some other relevant reasons for considering these methods as most appropriate ones compared with single-level designs. On the one hand, individuals in the sample may show different entrepreneurial behaviors within regions even holding the same characteristics (Bosma and Sternberg, 2014), in our case human capital levels. Consequently, considering that we are dealing with pooling observations, the assumption of independence of observations in this case could be violated (Hofmann et al., 2000; Autio and Wennberg, 2010) if we were using standard multivariate methods (Bosma and Sternberg, 2014). Then, multilevel has the advantage to control for the assumption of the independence of observations in grouped data (Bosma and Sternberg, 2014) avoiding this type of problems in grouped data. On the other hand, multilevel analysis allows us to interplay cross-level interactions (Hundt and Sternberg, 2014). It means the way the individual-level predictors could moderate the effect of the regional-level ones. Overall, due to our clear interest in cross-level effects (Autio and Wennberg, 2010) our model is stated as follows:

Individual-level component:

$$\begin{aligned} \text{Log}(\pi_{ij})_t &= \beta_{0j} \\ &+ \beta_{pj} \{\text{individual-level predictors } t\} \\ &+ \beta_{cj} \{\text{individual-level controls } t\} \\ &+ r_{ij} \end{aligned} \quad (1)$$

Regional-level component:

$$\beta_{0j} = \gamma_{00} + \gamma_{01} \{\text{regional-level predictors } t\} + \gamma_{02} \{\text{regional-level controls } t\} + \mu_{0j} \quad (2)$$

$$\beta_{pj} = \gamma_{p0} + \gamma_{p1} \{\text{regional-level predictors } t\} + \gamma_{p2} \{\text{regional-level controls } t\} + \mu_{pj} \quad (3)$$

In the model above π_{ij} represents a continuous measure where the individual i assigned in a region j will determine his/her growth aspirations. Normalizing with logarithm the previous measure, variable β_{0j} is the coefficient that each individual hierarchically nested in a specific region will have on growth aspirations. β_{pj} and β_{cj} are the coefficients for individual-level variables corresponding to the model 1, γ_{00} is the mean of the intercepts, also called “constant” (Autio and Wennberg, 2010) across groups (provinces) and γ_{p0} is the mean of the slopes across groups (provinces). γ_{01} and γ_{02} are the coefficients for regional-level variables in the model 2. γ_{p1} and γ_{p2} are the coefficients of cross-level interaction terms. Individual-level and regional-level residuals are capturing the random part of the equation meaning that r_{ij} indicates the individual-level residual and μ_{0j} , μ_{pj} the regional-level ones.

Our objective is to examine both individual and regional determinants of growth aspirations. We estimate three models in our study. First, we consider the fixed-effects variables at individual-level. Second, we specify random-effects at the regional-level and we test the main effect of population density on entrepreneurial growth aspirations (hypothesis 1). Third, we estimate in a full model the moderating role of human capital on the relationship between population density and entrepreneurial growth aspirations (hypotheses 2, 3 and 4).

RESULTS

In this section, we first provide descriptive statistics and correlations (Table 1). Next, we present the multilevel regression results (Table 2). Table 1 shows that the average age of individuals in the sample is 40 years and that almost 60% of them are men. Reflecting the recessive economic period of the study, the majority of the nascent entrepreneurs (58%) do not see good opportunities in the next six months to set up a business in their area. The vast

majority of individuals (89% of the sample) were born in Spain and a total of 59% of entrepreneurs declare they know personally other entrepreneurs who started-up in the last two years. The average size of an entrepreneur's household is about three family members. Some 18% of the entrepreneurs in our sample admit that their entrepreneurial activity is driven by necessity. In terms of industry, 28% of the new ventures are in the manufacturing sector.

Regarding the level of education, 34% of the nascent entrepreneurs have higher education qualifications (university degree). Those who have received entrepreneurship training, that is, those who have been involved in training activities aimed at improving their entrepreneurial skills and knowledge, represent almost 40% of the sample. Those nascent entrepreneurs who are owners or managers of an existing business make up 34% of the sample.

With regard to the regional variables, the average population density is 336.38 inhabitants per squared kilometer. The annual unemployment rate increased 36.6% at provincial level (on average). This shows how hard the economic crisis has hit the Spanish economy in the period covered in our analysis. The annual population change is about 1.53% inhabitants and the average GDP per capita among provinces is about €23,604.53.

Bivariate correlations show that entrepreneurial growth aspirations are positively related to population density, entrepreneurs' education and entrepreneurship training, but negatively associated with the entrepreneurs' owner-manager experience.

----- Insert Table 1 about here -----

Table 2 presents the results of the multilevel regression analysis. Individual-level variables linked to higher education, entrepreneurship training and owner-manager experience are introduced in model 1. Model 2 incorporates the effects of regional variables and thus shows the influence of population density on entrepreneurial growth aspirations. Model 3 examines the results of our three interaction terms, that is, the moderating role of higher education, entrepreneurship training and owner-manager experience on the relationship between population density and aspirations.

The results presented in model 2 show that entrepreneurial growth aspirations are positively related with population density; which provides support for hypothesis 1. Consistent with the

pattern observed in bivariate correlations, entrepreneurship training has a significant a positive effect on growth aspirations, whereas owner-manager experience is negatively associated with aspirations.

The results of model 3 however indicate that the positive effect of population density observed in model 2 varies with the nascent entrepreneurs' human capital attributes. As such, the interactions between population density and higher education and between population density and owner-manager experience are statistically significant, whereas no significant effect is found for the combination of population density and entrepreneurship training. Hence, both hypotheses 2 and 4 are supported, but hypothesis 3 does not receive support. These results suggest that higher education and owner-manager experience may lead to a better understanding of the benefits and risks related to setting up a new firm in densely populated regions, whereas entrepreneurial training would not have such effect.

----- Insert Table 2 about here -----

To gauge a more precise understanding of these results, we present the corresponding interaction plots. Figure 2 and 3 depict the interaction effects of population density and higher education and population density and owner-manager experience on growth aspirations, respectively. It can be observed that, consistent with our prediction, the relationship between population density and growth aspirations changes with nascent entrepreneurs' educational level and prior owner-manager experience. In particular, growth aspirations in densely populated provinces tend to increase with the educational attainment (i.e. higher education) and the previous owner-manager experience of nascent entrepreneurs. Interestingly, figure 3 shows that growth aspirations of nascent entrepreneurs who have previous entrepreneurial experience are smaller than those without such experience, irrespective of the regional population density. This result may be reflecting a negative impact of the economic crisis that owner-managers have probably experienced in their previous businesses, which may have adjusted their growth aspirations for existing and new businesses downwards.

----- Insert Figure 2 about here -----

----- Insert Figure 3 about here -----

A number of control variables are found to be statistically significant. First, younger entrepreneurs are more likely to have higher growth aspirations, whereas the entrepreneurs' family size shows a negative influence on such aspirations. Additionally, results show that being in the manufacturing sector is positively related to aspirations. As per the regional variables, the GDP per capita has a negative influence on aspirations. This, somehow unexpected, result maybe reflects differences in the degree of industrialization of the provinces. It means that in regions with higher levels of GDP per capital, individuals are also more likely to perceive founding opportunities (Stuetzer et al., 2014) and therefore these regions are probably more industrialized ones. Nevertheless, provinces with low GDP per capita are also among the less industrialized ones. To the extent that new business may reflect the industry structure of the province, new ventures in less industrialized provinces may tend to be more labor intensive than those formed in more industrialized provinces. This may lead to entrepreneurs in less industrialized provinces to have greater aspirations for growth in the number of employees. Moreover, regarding the sector, those founders with industry experience will be more likely to stay on the industry segment they were before becoming self-employed (Dencker and Gruber, 2014).

DISCUSSION AND CONCLUSIONS

This study contributes to our knowledge about the formation of entrepreneurial growth aspirations by examining two under-researched but important issues: (1) the unique effects of regional population density, and (2) the joint effects of population density founder characteristics. We have used a rich data set that combines individual observations corresponding to nascent entrepreneurs from the Spanish GEM Adult Population Survey with regional data from the Spanish Statistic Institute. Our research extends prior research to show not only the tight connection between overall economic conditions and individual growth aspirations but also that such connection is contingent upon the human capital of the nascent entrepreneurs. In this regard, our results have highlighted the importance of higher education and prior entrepreneurial experience.

Our findings provide a number of important insights for the literature. First, we have confirmed our expectation that regional population density has a positive effect on the growth aspirations of nascent entrepreneurs. This finding points to the importance of local demand and access to resources for new businesses, since these entrepreneurs appear to assess whether

their surrounding environment offers them the opportunity to grow their businesses. Furthermore, it is possible that the higher performance threshold required in densely populated areas tend to increase their aspirations to grow in the first few years of the new business. Overall, the regional context affects not only the start-up decision, as extensively shown by previous research (e.g. Malecki, 1997; Mueller et al., 2008; Bosma and Schutjens, 2011; Trettin and Welter, 2011) but also the aspirations (Kibler et al., 2014) of nascent entrepreneurs, as indicated by this study.

Second, our study shows that the positive impact of population density on entrepreneurial growth aspirations is shaped by the human capital endowments of entrepreneurs. Specifically, we observe that the effect of population density on growth aspirations varies with the higher education and the owner-manager experience of the entrepreneur. In effect, as advanced, the results show a positive impact of the joint effect of higher education and population density on entrepreneurial aspirations. Hence, we find support for the notion that university level education provides entrepreneur with knowledge and a mental frame that allow them to recognize that higher required performance threshold that is required in highly populated regions to compensate for a higher business failure risk. Similarly, the positive impact of the joint effect of owner-manager experience and population density on entrepreneurial aspirations, would indicate that entrepreneurs with entrepreneurial and manager experience are, again, more likely to recognize that greater growth required in denser regions.

Our results show a positive impact of entrepreneurship training on growth aspirations. The resource-based theory of the firm suggests that the recognition of opportunities, learnt from entrepreneurship training, is a distinctive ability of individuals (Alvarez and Busenitz, 2001; Brush *et al.*, 2001). However, unexpectedly, the joint effect of population density and entrepreneurship training is not statistically significant. The knowledge and skills gain by individuals in opportunity identification and exploitation through entrepreneurship training should allow trained entrepreneurs to discover and exploit “good” entrepreneurial opportunities, and recognize the greater performance threshold required in densely populated environments. But as noted, that is not the case. Together the results indicate that individuals who have received entrepreneurial training hold greater growth aspirations independent of the context, or at least independent of the population density of the region in which they live. The question to be elucidated is what drives such behavior. Is it the result of training that facilitates the discovery of opportunities even in less favorable environments? Or is it a

reflection of an overconfidence bias (Koellinger *et al.*, 2007)? Future research should try to answer these questions. The answer will have some important practical implication for those involved in entrepreneurship courses/training, such as business schools and governmental agencies. While research is needed to disentangle whether the growth aspirations of those who receive entrepreneurship training are accurate or not, it may be worth thinking about the extent to which entrepreneurship training nurtures an excess of entrepreneurs' confidence in their capabilities. We should perhaps ask ourselves as educators to what extent we are feeding an overconfidence bias, in the sense that entrepreneurs who receive entrepreneurship training may tend to be overly optimistic about the prospects of their enterprises in the face of negative economic shocks.

Third, our results confirm (see for example Autio and Acs, 2010; Stam *et al.*, 2012) that higher education has a positive impact on the growth aspirations of nascent entrepreneurs. In this vein, the evidence sustains the notion that the opportunity costs of more educated individuals are higher and therefore will demand greater return from their entrepreneurial activities. Hence, they will launch new venture if their growth potential is high enough to offset their better employment opportunities in the job market. This, probably coupled with their greater self-efficacy (Autio and Acs, 2010) leads to higher growth aspirations as compared to individuals with less education.

Fourth, entrepreneurs' owner-manager experience is the only personal variable (apart from age) that has a negative effect on entrepreneurial growth aspirations. This result indicates that there is a significant difference in the way the regional economic conditions impact aspiration when the entrepreneurs have owner or manager experience. This leads us to think that entrepreneurs with prior entrepreneurial or manager experience, and that have probably experienced, the economic impact of a recessive period, are more likely to adjust their growth aspirations ("downward") faster than other entrepreneurs.

Our study is not free of limitations. These limitations open opportunities for relevant future research. Our research is based on data from a single country and for a three-year period. Hence, it would be necessary to test our conceptual model on the determinants of growth aspirations by using data from other countries and for a longer time period. Readers should also bear in mind that the time period analyzed coincides with a global economic recession. More favorable conditions could have strengthened or weakened the results. Additionally,

while there is much value in examining the interactions between factors at the individual and regional level, future research should examine these issues by including national-level determinants.

We would also like to note that our moderating variables (i.e. higher education, entrepreneurship training and owner-manager experience) have been measured as binary outcomes. Interesting insights could be gained if future research accounts for the nature of higher education, the type of training (e.g. voluntary or compulsory training) and distinguishing clearly between entrepreneurial and manager experience.

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Figure 1

Conceptual model and hypotheses

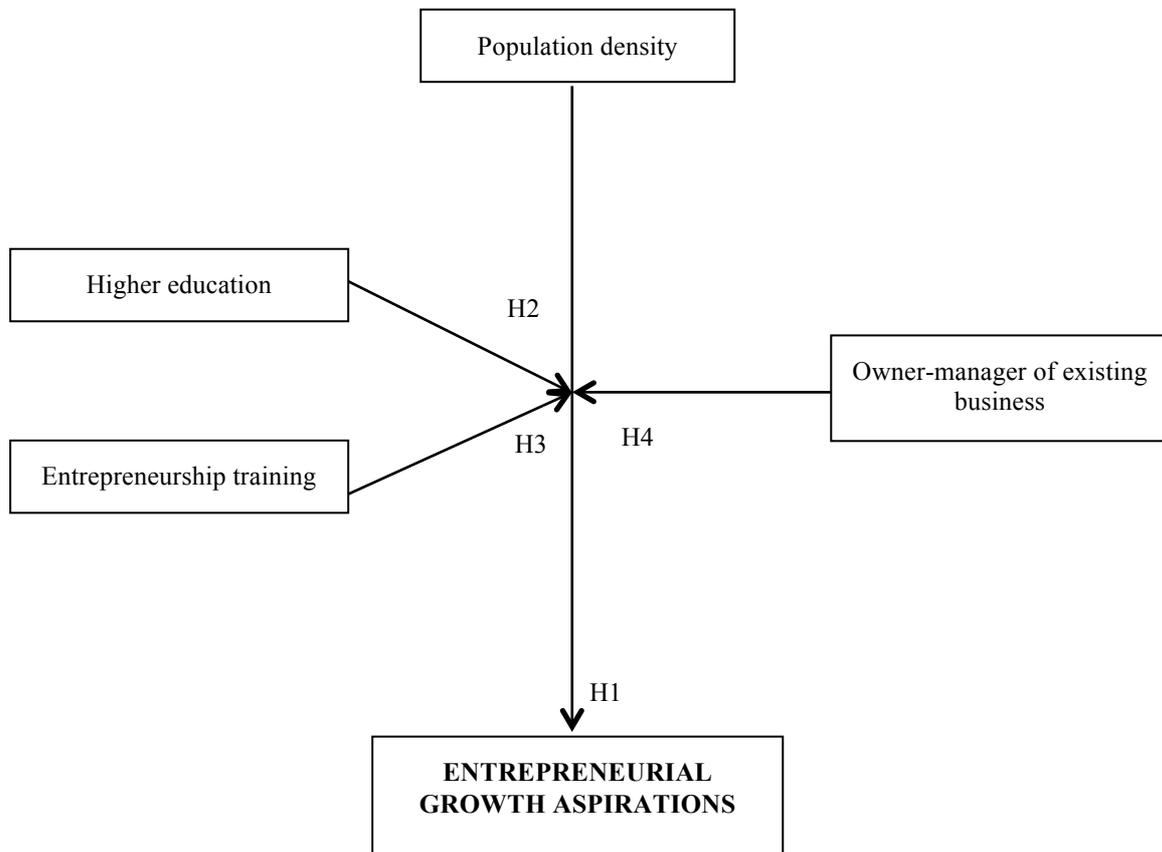


Figure 2

Moderating effect of higher education on the relationship between population density and entrepreneurial growth aspirations

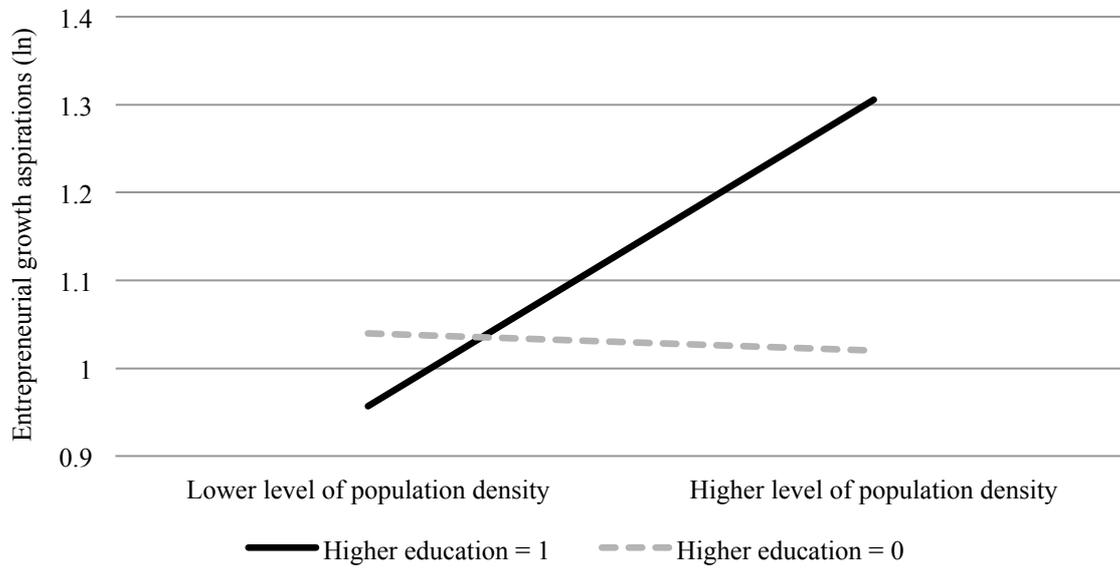


Figure 3

Moderating effect of owner-manager experience on the relationship between population density and entrepreneurial growth aspirations

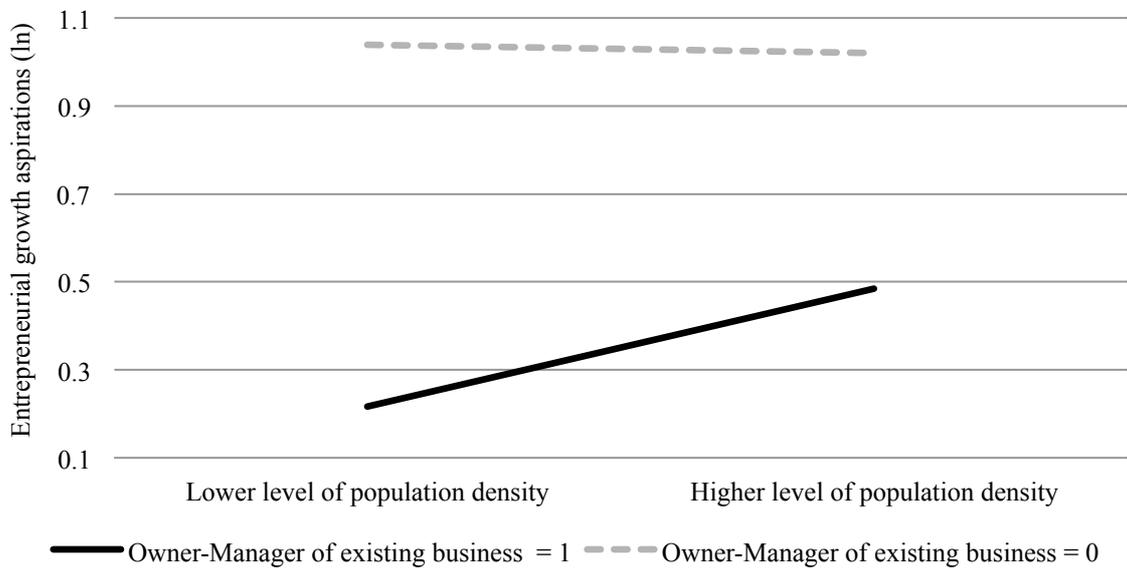


Table 1

Descriptive statistics and correlation matrix ^a

	Mean	S.D.	1	2	3	4	5	6	7	8	9
1. Entrepreneurial growth aspirations (Ln)	0.6	0.82	1.000								
2. Age	40.56	10.92	-0.160 ***	1.000							
3. Gender	0.59	0.49	0.088 **	-0.004	1.000						
4. Opportunity perception	0.42	0.49	0.181 ***	-0.026	0.044 *	1.000					
5. Fear of failure	0.31	0.46	-0.075 **	0.021	-0.092 ***	-0.135 ***	1.000				
6. Spanish nationality	0.89	0.31	-0.055	0.045 **	0.065 **	-0.077 **	0.010	1.000			
7. Know personally an entrepreneur	0.60	0.49	0.067 *	-0.040 *	0.061 **	0.149 ***	-0.055 **	0.015	1.000		
8. Family size	3.27	1.32	-0.079 **	0.019	-0.043 *	-0.035	0.004	0.009	-0.023	1.000	
9. Necessity entrepreneurship	0.18	0.38	-0.003	0.035	-0.060 **	-0.076 **	0.069 **	0.033	-0.030	0.057 **	1.000
10. Higher education	0.34	0.47	0.144 ***	-0.074 ***	0.009	0.003	-0.067 **	-0.017	0.038 *	-0.036	-0.038 *
11. Entrepreneurship training	0.39	0.49	0.111 **	-0.069 **	0.028	-0.022	-0.084 ***	-0.019	0.056 **	-0.029	-0.010
12. Owner-manager of existing business	0.34	0.47	-0.484 ***	0.162 ***	-0.038 *	-0.146 ***	0.008	0.077 ***	0.028	0.027	0.016
13. Manufacturing	0.28	0.45	-0.023	0.066 **	0.080 ***	-0.016	0.031	0.021	0.000	0.041 *	0.032
14. Annual unemployment rate change (in percentage units)	0.36	0.25	-0.198 ***	-0.029	0.022	-0.022	-0.049 *	-0.056 **	-0.028	-0.014	-0.070 **
15. Annual population change (%)	1.53	1.09	-0.106 **	-0.005	-0.036	0.054 **	-0.010	-0.067 **	-0.009	0.017	-0.101 ***
16. GDP/h (€ in thousands)	23.60	4.53	-0.089 **	0.026	-0.022	0.058 **	-0.038 *	-0.057 **	0.013	-0.040 *	-0.098 ***
17. Population density (Inhab/km ² in thousands)	0.33	0.72	0.152 ***	-0.060 **	0.016	0.015	-0.003	-0.015	0.012	0.082 ***	-0.026
	10	11	12	13	14	15	16	17			
10. Higher education	1.000										
11. Entrepreneurship training	0.123 ***	1.000									
12. Owner-manager of existing business	-0.024	-0.016	1.000								
13. Manufacturing	-0.013	-0.013	0.061 **	1.000							
14. Annual unemployment rate change (in percentage units)	-0.012	0.054 **	-0.044 *	0.036	1.000						
15. Annual population change (%)	-0.007	-0.133 ***	-0.098 ***	0.002	0.411 ***	1.000					
16. GDP/h (€ in thousands)	0.064 **	0.011	0.039 *	-0.019	0.006	0.205 ***	1.000				
17. Population density (Inhab/km ² in thousands)	0.025	0.069 **	-0.022	-0.043 *	-0.188 ***	0.155 ***	0.038 *	1.000			

* p< 0.10, ** p< 0.05, *** p< 0.001.

Table 2

Multilevel regression results predicting entrepreneurial growth aspirations

Variables	Model 1	Model 2	Model 3
<i>Individual-level controls</i>			
Age	-0.006 (0.002) **	-0.006 (0.002) **	-0.006 (0.002) *
Gender	-0.135 (0.082)	-0.134 (0.082)	-0.131 (0.081)
Opportunity perception	0.135 (0.081) *	0.133 (0.082)	0.131 (0.081)
Fear of failure	0.054 (0.065)	0.058 (0.065)	0.061 (0.066)
Spanish nationality	0.097 (0.087)	0.097 (0.087)	0.096 (0.084)
Know personally an entrepreneur	0.030 (0.054)	0.033 (0.054)	0.025 (0.053)
Family size	-0.032 (0.020)	-0.035 (0.020) *	-0.035 (0.019) *
Necessity entrepreneurship	0.002 (0.084)	0.005 (0.083)	0.012 (0.083)
Manufacturing sector	0.198 (0.081) **	0.201 (0.080) **	0.197 (0.079) **
Year 2009	0.043 (0.113)	0.041 (0.124)	0.025 (0.117)
Year 2010	0.064 (0.094)	0.088 (0.112)	0.083 (0.107)
<i>Individual-level predictors</i>			
Higher education	0.085 (0.060)	0.086 (0.060)	0.101 (0.054) *
Owner-manager of existing business	-0.693 (0.086) ***	-0.687 (0.084) ***	-0.679 (0.075) ***
Entrepreneurship training	0.134 (0.066) **	0.137 (0.066) **	0.144 (0.066) **
<i>Regional-level controls</i>			
Annual unemployment rate change		0.031 (0.179)	0.057 (0.181)
Annual population change		0.027 (0.054)	0.027 (0.054)
GDP/h		-0.014 (0.006) **	-0.016 (0.006) **
<i>Regional-level predictors</i>			
Population density		0.190 (0.077) **	-0.013 (0.130)
<i>Interaction effects</i>			
Population density × Higher education			0.254 (0.116) **
Population density × Owner-manager of existing business			0.198 (0.103) *
Population density × Entrepreneurship training			0.135 (0.131)
Intercept	1.158 (.243) ***	1.375 (.306) ***	1.490 (.274) ***
SD at the province-level	0.018 (0.015) **	0.014 (0.013) **	0.012 (0.012) **
SD at the individual-level	0.419 (0.047)	0.417 (0.047)	0.415 (0.048)
N of observations	643	643	643
N of groups	48	48	48
Wald chi square	773.80 ***	801.72 ***	2098.91 ***

Table reports non-standardized β coefficients. Robust standard errors are in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$.