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Entrepreneurial activity and regional development

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Section INTRODUCTION

Investigaciones Regionales

Entrepreneurial activity and regional development: an introduction to this special issue

Maribel Guerrero *, Iñaki Peña-Legazkue *

«All brief sentences about the economy are intrinsically false»

Alfred MARSHALL.

ABSTRACT: The main objective of this special issue is to analyze the relationship between entrepreneurial intention and entrepreneurial activity and its impact on regional development. The last convulsive decade, withexpansionary and recessionary economic cycles, offers a good opportunity to study how economic cyclesaffect the propensity of becomingan entrepreneur and, in turn, to observe how entrepreneurial activity contributes to change (improvement) in the economy. Previous studies have analyzed the complicated endogenous relationship between entrepreneurship andeconomic growth, but thesestudies haveexamined the countries' performance under a static view. This special issuefocuses on analyzing complex entrepreneurial behavior from a sub-national perspective (examining several regionsin the Spanish autonomous communities) and a dynamic view (using data from several years), which adds rigor and valuable knowledge to this research field.

JEL Classification: R11; O33; D24.

Keywords: entrepreneurship; regional development; economic growth.

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Actividad emprendedora y desarrollo regional: una introducción al número monográfico

RESUMEN: Uno de los objetivos principales de este número monográfico es analizar la relación existente entre la intención y la actividad emprendedora, y su incidencia en el desarrollo regional. Esta última década convulsa, con ciclos económicos expansivos y contractivos, ofrece una buena oportunidad para estudiar cómo la coyuntura económica afecta a la propensión emprendedora, y, a su vez, para observar hasta qué punto la actividad emprendedora contribuye al cambio (mejora) de la economía. Existen numerosos estudios que han analizado esta complicada relación endógena entre emprendimiento y crecimiento económico, pero la mayoría de los trabajos de investigación han partido del análisis del comportamiento de países y bajo una visión estática. En este número monográfico, la mayoría de los estudios analizan el complejo comportamiento emprendedor desde una perspectiva sub-nacional (regiones de las Comunidades Autónomas de España) y desde una óptica dinámica (con datos de varios años recientes), lo que añade rigor y valioso conocimiento a esta disciplina.

Clasificación JEL: R11; O33; D24.

Palabras clave: emprendimiento; desarrollo regional; crecimiento económico.

1. Introduction

For several decades, the determinant factors of a region's wealth have been present in academic and political debate. The heterogeneity (and disparity) in economic welfare rates globally makes it clear that certain regions have developed capabilities over time to preserve —and even to increase— their comparative advantage in terms of GDP per capita. This leads us to think that certain regions have some idiosyncratic capabilities that are exceptional for successful economic development but that sometimes these capabilities work to the detriment of social, environmental and human development. The discovery and analysis of these regional capabilities could require a lot of time and effort to debate. And furthermore, even if we were to reach a consensus on the properties of these capabilities, extrapolating them for imitative construction and application to other regions could be a dangerous exercise, since the contexts are different and not all regions have the same absorptive capacity.

In the second half of the past century, Nobel Prize laureate Robert Solow attributed economic growth to technical change or, in other words, to technological progress beyond the optimum allocation of resources (labor force and capital). Adopting a neoclassical approach, previous studies have analyzed the key determinants of economic growth. For instance, some authors found that the main causes were the positive externalities stemming from information (Arrow, 1962), innovation (Griliches, 1979) and knowledge (Romer, 1986). Interestingly, these concepts are linked to the improvement of organizations' productivity and, therefore, with a region's economic development.

History has evidenced that investment in R&D and innovation is not enough to support economic growth. This investment must be recouped, and this implies that the market should pay above the investment in innovation. An excellent innovation capacity is meaningless if it is not accompanied by an ability to generate value. More than a decade ago, one of Europe's top leaders, Romano Prodi, indicated that European countries were not growing enough for the efforts in innovation that took place on this continent. It is well known that Europe has not fulfilled the target agreed upon in the Lisbon Agreement of reaching a 3% investment in R&D over GDP for 2010. However, what is even more worrying is that today Europe lacks a strong ability to transform into value all the investments in R&D and innovation.

Audretsch and Keilbach (2004) argue that a region must be endowed with entrepreneurship capital that enables the channeling of innovation into the market and thereby contributes to economic growth. This channeling process is complex and obstacle-ridden. Some of the barriers are those of the market itself; others are institutional, cultural and so on. Only by overcoming these barriers can knowledge filters create value in the market and improve productivity of resources. González *et al.* (2009) argue that this process could trigger a virtuous cycle of development: «while region's innovation capital and entrepreneurship capital may affect the achievement of higher levels of productivity, competiveness and economic welfare, it is also true that the level of prosperity may well affect the enrichment of innovation capital and entrepreneurship capital». Precisely, this endogenous phenomenon can explain in part the persistence of the disparity among regions in their respective levels of welfare as well as the impact that certain regional capabilities (such as innovation and entrepreneurial success) have on their economies.

The growing interest in this debate gave rise to the «Entrepreneurial Activity and Regional Development» workshop organized by the Orkestra-Basque Institute of Competitiveness, in San Sebastian on 19th-20th July 2012. The workshop brought together numerous national and international researchers to discuss themes related to entrepreneurial intention and the creation of new business in expansionary and recessionary economic periods. This special issue includes several papers that were presented during this event, which offer a rich diversity of conceptual frameworks and methods, as well as an eclectic perspective of this phenomenon. The majority of papers do share a common element; they used data provided by the GEM (Global Entrepreneurship Monitor) project, which has opened new possibilities for study.

This special issue has two objectives. First, we want to delve into entrepreneurship as a driving force of economic development. We intend to examine the reasons that motivate the creation of new businesses, through the study of the effect caused by both individual and contextual factors. Second, we want to study this phenomenon during different economic expansion and contraction. We have witnessed significant changes in the Spanish economy during the recent decade. Working out what effect said changes have on entrepreneurial activity and, reciprocally, what effect the creation of companies has on economic development is (and will continue to be) an important research challenge.

The contributions of this special issue, although modest, are remarkable, and provide at least two interesting contributions to the literature in this field. On one hand, the papers explore a diverse range of contexts (investment, university, social and economic contexts) and their links to entrepreneurial behavior in Spanish regions. This diversity of perspectives allows for a better understanding of the topic. On the other hand, the papers analyze different entrepreneurial agents, such as the person who has a business idea (the person who is potentially an entrepreneur but who has not yet started up a business), the person who has created a company, or the person who has invested in and accompanies a project (a business angel). The recognition and study of all these agents who belong to a region's entrepreneurial ecosystem gives us a more accurate view of the way entrepreneurship capital works, which is so important for economic development and about which we know so little, according to Audretsch and Keilbach (2004).

On the other hand, this special issue highlights a few key points aimed at those public authorities who are responsible for the design and implementation of policies and actions that foster entrepreneurship. As well as the demography and entrepreneurship experiments changes and transformation by the creation of new business, closing of established business, with the more or less long-lived survival of start-ups, and so on, public policies also appear, disappear and are reinvented over time. Our interest in this issue is to prompt new reflections and debate among the academic community and public policy makers about the complex relationship between entrepreneurial activity and regional development.

2. Research Interest on «Entrepreneurial Activity and Regional Development»

Many authors argue that entrepreneurial activity is an important driving force behind regional development. Some of the arguments put forward to support this assertion refer to the higher market competition and the increased productivity attained with the appearance of new entrepreneurs. Certainly, entrepreneurs can inject not only greater efficiency into the market but also a higher dose of innovation through the development of new technologies (acknowledging that a percentage of those technologies also become disruptive).

Following Audretsch and Keilbach's (2004) reasoning, economic growth can be explained by the traditional production factors (capital and labor force), but they add the effect of a region's innovative and entrepreneurial capacity. In particular, the authors propose the following expression:

$$Y_i = \alpha\ K_i^{\beta_1} L_i^{\beta_2} R_i^{\beta_3} E_i^{\beta_4} \varepsilon \tag{1}$$

where Y reflects the production of a region i, α represents productivity, K refers to physical capital, L describes labor force, R reflects knowledge capital, E denotes entrepreneurship capital and ε would be the error term. This expression is an

extended version of the orthodox production function, with the added complements of innovation (Romer) and entrepreneurship (Audretsch) resources, which are necessary for economic growth.

There are alternate ways to interpret this relationship. For example, González *et al.* (2012) propose a relationship where growth depends on productivity (α) and on physical (tangible) resources such as capital *K* and labor force *L*. However, these authors propose a new expression where the productivity that symbolizes technological progress is directly correlated to the region's innovative and entrepreneurial capability; that is, $\alpha_{it}(R_i, E_i)$.

$$\frac{Y_{it}}{L_{it}} = \alpha_{it}(R_i, E_i)\left(\frac{K_{it}}{L_{it}}\right)^{\beta} \tag{2}$$

In this model, innovation and entrepreneurship are conceived as *intangible* capacities instead of *physical* resources, which affect regional productivity over time, *t*, and, therefore, on the economic development (growth) of a region, *i*. Certainly, the complexity of the phenomenon still allows for the introduction of new interpretations of the relationship between entrepreneurial activity and economic development.

As proof of this interest and of the evolution this field of study is undergoing, it is worth noting that since the last decade of the past century at least four special issues have been published on this subject in two recognized foreign journals: two in *Regional Studies* and two in *Small Business Economics*. At a national level, *Investigaciones Regionales* devoted an interesting issue to this theme in 2009; and our special issue would be a continuation of that concept.

In 1994, *Regional Studies* published the special issue coordinated by Reynolds, Storey and West head, who included papers that studied the determinant factors on the variation of entrepreneurship rates in seven countries (Germany, France, Italy, Ireland, the United Kingdom, Sweden and the United States). The main conclusions extracted from this 1994 special issue were (1) that the differences on entrepreneurship rates were negligible, (2) that country conditions had a relevant impact on the lower/higher rate of business creation and (3) that entrepreneurial activity was a necessary condition but not sufficient for economic growth.

Ten years later, Acs and Storey (2004) coordinated another special issue for *Regional Studies*, focusing on the relationship between entrepreneurship and economic growth. The authors studied the effect of entrepreneurial activity on economic development in four countries (Germany, Hungary, United Kingdom and United States) and in four different economic periods. Three of the four studies found that entrepreneurial activity had a positive effect on economic growth —not directly, but rather through the building of a more competitive economy—. This conclusion questioned the immediate effect that business creation could have on the economy.

Acs and Szerb (2007) introduced the public policy component within this relationship in a special issue published in *Small Business Economics*. They recom-

mended to emphasize the idea that «one-size-fits-all» policies —or, in similar terms, «a cookie-cutter approach»— will not work given the enormous diversity of socio-economic and cultural contexts. Middle-income countries should focus on improving their human capital and technological infrastructures, while high-income countries should invest in labor force and finance reforms to ensure the success of high-growth start-ups. Therefore, public policy makers should pay attention not only to the quantity but also to the quality of entrepreneurial activity.

In 2008, Fritsch coordinated a new special issue for *Small Business Economics*, which intended to measure the delay that occurs in entrepreneurial activity's effect on the economic growth in Germany, Spain, Portugal, Holland, Germany, the United States and 21 OECD countries. The special issue indicated that this delay will last at least 10 years, and that the effect of each and every one of the entrepreneurs is not uniform. Gazelle firms (those that grow at rates above 20%, for example in employment for three consecutive years during their first five years of life) would most intensely influence this impact on the economy.

In 2012, Audretsch and Peña coordinated another *Small Business Economics* special issue, of which two ideas stand out. First, the regional heterogeneity that exists within each country should not be ignored when conducting research studies. Therefore, studies must choose to focus on smaller-scale geographical areas in order to reach more accurate conclusions. Second, a bi-directional causal relationship must be recognized. Until now, in previous special issues, the effect of entrepreneurial activity on economic growth had been analyzed. However, the level of an economy can influence, in turn, the characteristics of entrepreneurial activity in a region.

At a national level, in 2009 *Investigaciones Regionales* devoted an interesting special issue coordinated by Professor Segarra to the subject of «Innovation, Entrepreneurship and Territory». This issue highlighted the relevance of analyzing business dynamics and innovation adopting a territorial perspective, given the growing synergy between two important disciplines such as industrial economics and spatial economics. Segarra (2009) pointed out that entrepreneurs —the missing link— set themselves up as agents of change and innovations. Entrepreneurs can both burst onto the market severely (following Schumpeter's concept of «destructive creation») and contribute to regional development (following Audretsch's concept of creative construction).

3. Contributions of this Special Issue

The papers in this special issue are varied and their contributions reflect this diversity. Many of the papers are based on the exploitation of data from the GEM. Spanish researchers have been adhering to the GEM international consortium for more than a decade. GEM has been consolidated as a bench mark due to its emphasis on the regional study of this phenomenon, which is why many of the studies selected for this issue have used this data source.

Martínez, Mira and Gómez Gras's paper analyzes the effect of human capital as well as individual perceptions (when faced with failure, business opportunities and their capacity to start up businesses) on the decision to create a new business during different economic conditions. This study covers the period between 2005 and 2011 and offers strong empirical evidence that the perceptual variations described above have a bearing on the decision to start a business. For example, the binomial logistic regression analysis shows that the perception of having skills to create and develop a new business affects other variables (such as cultural, institutional, and so on) when launching a new business. This result is consistent regardless of the context (space and economic situation). Another interesting result suggests that opportunity perception encourages entrepreneurship markedly during periods of economic downturns. Another finding reveals that knowing other entrepreneurs also encourages entrepreneurship.

Coduras and Autio's investigation provides an analysis of the validity of the information provided by experts concerning the environmental conditions for starting up businesses in Spain. Several reports present numerous indicators to understand the environmental conditions, such as the *Global Competitiveness Report* prepared by the World Economic Forum, *Doing Business* published by the World Bank and so on. The national GEM consortium annually interviews 30 to 40 experts per autonomous community to find out their opinions on nine areas that describe different environmental conditions that influence entrepreneurship. The authors conclude that this information must be better utilized for conducting research work and for public decision making.

A different approach is used by Vidal and López, who emphasize the role of institutional and economic factors during the identification of business opportunities. Using data from between 2004 and 2010 and applying a methodology based on a structural equation model, the authors agree with the previous study by Martínez *et al.,* that entrepreneurial intention depends on perceptions about personal skills for starting businesses and the perception of business opportunities. Institutional factors, however, are not significant, or, if applicable, their effect turns out to be the opposite of what was expected.

Following an individual perspective, Capelleras, Contín-Pilart, Martín-Sánchez and Larraza-Kintana's paper provides a better understanding of how individual perceptions affect the decision to start a new firm (nascent entrepreneurship) and how this decision is also contingent upon the context in which actions are taken (urban/rural environment). Using data from the Spanish GEM project, the results of a series of logistic regression models indicate that opportunity perception and self-efficacy have a positive influence on the probability of becoming a nascent entrepreneur. Interestingly, the authors also find that individuals in rural areas who perceive new opportunities are more likely to become nascent entrepreneurs than those who live in urban areas.

Neira, Portela, Cancela and Calvo's paper added to previous findings that entrepreneurial activity motivated by the need to be self-employed is related to a percep-

tion of a greater fear of failure. The authors conclude that it can generate a dynamic that is detrimental for entrepreneurial activity in the middle term. Obtained by adopting a log it regression analysis, these results confirm to a large extent the results obtained by the rest of the studies in this special issue.

University context, as the cradle of potential and future entrepreneurs, regains special importance in the paper developed by Rueda, Fernández-Laviada and Herrero. Based on the theory of reasoned action and using a structural equation model, the authors argue the perceived advantages of entrepreneurship influence positively on the attitudes of Cantabrian university students and their start-up intentions. Conversely, the disadvantages associated with entrepreneurship are not significant when it comes to influencing their attitudes and intentions.

In this context, Poblete and Amorós paper explores the interaction effect between universities' support and entrepreneurs at the regional level. The authors replicate the methodology used by Coduras *et al.* (2008) in Spain using the database of the Global Entrepreneurship Monitor (GEM) in Chile. The main results indicate that there is low interaction between entrepreneurs and universities and there is not enough impact to affect significantly the entrepreneurial activity. Also, having entrepreneurship higher education could not increase the likelihood intentions to be an entrepreneur.

Lastly, Hoyos and Saiz's paper focuses on another important agent in a region's entrepreneurial ecosystem: the business angel. Business angels are investors who provide smart capital to an entrepreneur's business. In addition to money, business angels offer their experience and knowledge about the sector as well as their entire network of professional contacts. This entrepreneurial role, which is not studied much in our environment, is a key element to facilitate a fast scalability of entrepreneurial projects with high-growth potential. These projects are scarce, but they are very important for the transformation of the business sector and for economic development. The authors shed light on the profile of the business angel, who, unlike other informal investors (family, friends and fools), is characterized by higher level of income, education and entrepreneurial experience.

4. Implications for Public Policies and Academic Research

The complex relationship between entrepreneurial activity and regional development is difficult to understand, especially because of its bi-directional causality. It is difficult to state which of these concepts has a bearing on the other, and it is pretentious to guarantee within which period effect occurs. The academic community is aware that much remains to investigate regarding this interesting subject. In any case, we should mention a number of implications emanating from this special issue for the design of public policies and for advancing this research field.

Entrepreneurial activity can be studied as a systemic phenomenon, instead of focusing attention on the entrepreneur in an isolated way. Saxenian's study (1994)

indicates that places with high levels of prosperity, such as Silicon Valley, have developed due to a balanced evolution of different groups that influence the quality of entrepreneurial activity and its impact on local development: the university community, investors, services from professionals such as lawyers specialized in protecting intellectual property rights, consultants to advise companies and so on. This systemic view of the entrepreneurial phenomenon coincides with Audretsch's conception of entrepreneurship capital as a regional asset that is important for economic development. In this sense, public authorities must consider various groups (such as the ones mentioned above) to improve the capacities of each group individually and to effectively connect each and every one of the groups with each other, in order to build and improve the regional entrepreneurial ecosystem.

This special issue also alluded to the importance of those groups that promote entrepreneurship, as cited by Hoyos and Saiz; Rueda *et al.;* or Poblete and Amorós. Certainly, not all entrepreneurial activity is equal, nor is its economic impact the same. There are new firms whose scalability is more feasible because they bring together an entrepreneurial team, a business plan, market potential and an accompaniment (business angels, consultants, advisors, etc.) that is not within reach of just any business promoter. These companies (such as high-growth firms or gazelle firms) require from public administrations treatment that is different from that given to other entrepreneurs who lack their characteristics. Therefore, the public actions must be different, depending on the entrepreneurial segment one wants to address.

Within the population of entrepreneurs, we can find groups that require «inclusive» attention. We are referring to groups such as immigrants, the disabled, senior citizens, and so on. We can even include other minority groups such as young people (under 25) or women. Business creation implicitly leads to the vast majority of the cases of job creation. While it is true that fragile firms disappear early, it is equally true that new firms are created again (many of which are equally fragile). The authorities must ensure that new firms break into the market with increasingly more strength and with higher chances of survival and growth. That is how they will inject higher competition into the market and manage to create revenues in a more sustainable way over time. In other words, it is important to properly filter candidates for entrepreneurship —and more so now in times of crisis if we want to contribute to regional development in the medium to long term, when public resources are not exactly abundant—. That is why it is not only important to research the step that must be taken from the intention to start a business to the action of starting it (explained by Martínez *et al.,* and Neira *et al.*), but it is also necessary to study the determining factors for the success of newly created companies during the early stage of their life cycle.

While the (ambiguous) connection between entrepreneurial activity and regional development as awakened growing interest in recent years, we believe that this research field still has more questions than answers, and this circumstance invites continued advancement in the study of notable subjects. Cross-sectional

comparative studies have begun to proliferate, but more longitudinal studies are still needed, where we can better understand the entrepreneurial process through its successive stages (identification of opportunities, development of the idea, intention, creation, survival, growth, closure...) in various phases of economic cycles and for economies in various levels of development. An increasingly greater number of studies are published with the application of multilevel regression techniques, by means of which information from various units of analysis —such as people, organizations and regions— are used simultaneously. Entrepreneurs are affected by some personal internal variables for developing their business, but also by other external variables of other levels, such as those that refer to the company that they have created and the environment they operate in. The development of more sophisticated statistical techniques allows for the preparation of more accurate and rigorous studies through the use of data from multiple levels. The GEM research consortium provides useful information to scientifically advance in the field of entrepreneurship.

Other interesting lines of research are those which analyze the transfer of knowledge and the creation of value from universities, technology centers and so on via the creation of spin-offs (Guerrero and Urbano, 2011). Likewise, the capacity for regeneration, reinvention, diversification and reproduction via spin-offs/spin-outs, through the study of corporate entrepreneurship (intra-entrepreneurship) is a subject that merits further research (Hornsby *et al.,* 2013, Guerrero and Peña-Legazkue, 2013). There is no doubt that new results, new conclusions and new recommendations on these and other subjects will help us better understand the inconclusive connection between entrepreneurial activity and regional development.

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Section ARTICLES

Investigaciones Regionales

Influence of the economic cycle on the determinants of nascent entrepreneurial activity. An empirical analysis of the Spanish case

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ABSTRACT: This paper explores the contribution of a selection of elements representative of human capital and perception as determinants of entrepreneurship in different stages of the economic cycle. The results confirm the significance of self-efficacy, the perception of opportunities, and the fear of failure, and highlight the importance of personal knowledge of entrepreneurs. They remain influential in different economic times in which their analyses have been replicated, although some differences are felt that point to, in contraction periods, a loss of influence of the confidence in one's own abilities, compared to an increase in the case of judgment on the existence of opportunities in the environment, and in the case of the presence of entrepreneurs in the surrounding context. In contrast, the behavior of the fear of failure, as a barrier to entrepreneurship, remains unchanged in an adverse context with respect to a positive context due to reduced opportunity costs.

JEL Classification: E32; G01; L26; M13.

Keywords: GEM; determinants; entrepreneurship; nascent entrepreneurs; perceptions; environment; economic cycle.

Influencia del ciclo económico sobre los determinantes de la actividad emprendedora naciente. Un análisis empírico del caso español

RESUMEN: Este trabajo explora la contribución de una selección de elementos representativos de capital humano y de percepción como determinantes de la creación de empresas ante distintas etapas del ciclo económico. Los resultados confirman la significación de la autoeficacia, la percepción de oportunidades y el miedo al fracaso, y resaltan la importancia del conocimiento de emprendedores. Su influencia se mantiene en los distintos momentos económicos en los que se han

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replicado los análisis, si bien se intuyen algunas diferencias que apuntan, en etapas contractivas, a una pérdida de influencia de la confianza en las propias habilidades, frente a un incremento en el caso del juicio sobre la existencia de oportunidades en el entorno y en el caso de la presencia de emprendedores en el contexto cercano. En cambio, el comportamiento del miedo a fracasar, como barrera para emprender, se mantiene invariable en un contexto adverso respecto a uno positivo debido a la reducción de costes de oportunidad.

Clasificación JEL: E32; G01; L26; M13.

Palabras clave: GEM; determinantes; creación de empresas; emprendedores nacientes; percepciones; entorno; ciclo económico.

1. Introduction

The GEM Project in Spain has been compiling entrepreneurial data in that country for more than ten years. This has provided for a rich database of information about variables related to entrepreneurial activity during different economic times.

This potential of GEM facilitates, among others, the analysis over time of the ability of different elements to influence that are assumed in the literature to be determinants in the creation and start up of businesses. In particular, if we consider the evolution of the economy in recent years, which has progressively shifted from a period of growth to one of contraction and crisis, we feel it is important to inquire about possible differences in the influence that recognized determinants of entrepreneurship may wield in different economic environments.

In this sense, this paper's purpose is mainly empirical, focused on analyzing the capacity of some elements of human capital and perception to influence nascent entrepreneurial activity, in addition to their evolution throughout the last seven years, identifying possible differences at different times of the economic cycle.

Its objective, therefore, is to analyze whether different growth and recessionary environments condition the behavior of the determinants of entrepreneurial activity. This way, this paper's contribution derives from the use of an extensive temporal comparison of influential elements in the individual decision to start a business, with the conviction that studying entrepreneurial activity within a territory, under objectively different stages of the economic cycle, may contribute to improve the understanding of the determinants of entrepreneurship.

2. Entrepreneurial activity and the economic environment

There is broad consensus on the positive role that entrepreneurship plays for territorial development (Acs & Audretsch, 2003; Wagner & Sternberg, 2004; Reynolds *et al.*, 2005; Mueller, 2006; Minniti & Lévesque, 2008), and several studies have

shown its positive effects in terms of job creation, economic growth, and innovation (*e. g.,* van Praag & Versloot, 2007; Acs *et al.*, 2008).

This relationship does not only move in one direction, as the set of conditions that form the setting, and particularly, those that lead to the economic environment, in turn have a considerable influence on the rate of entrepreneurial activity in the territory (Reynolds *et al.*, 1994; Carree & Thurik, 2003; Bergmann & Sternberg, 2007).

Thus, rates of entrepreneurial activity may differ considerably between different territories and between different periods, due to the peculiarities of their environments (Verheul *et al.*, 2002), and the dynamics of entrepreneurship may be very different depending upon the institutional context and level of development (Acs *et al.*, 2008).

Several empirical studies show that these different entrepreneurship rates between regions are affected by economic, cultural, and institutional components, while inter-temporal differences within the same territory are dominated by influences from within their own economic environment (Wennekers *et al.*, 2002; Freytag & Thurik, 2007). That is, between different regions, different entry rates of the entrepreneurial process may largely be explained by their structural characteristics (Naudé *et al.*, 2008), while from an evolutionary or temporal point of view, within a given territory, the context shaping the economic environment would be that primarily influential on the dynamics of entrepreneurial activity (Acs *et al.*, 2008).

The current crisis is bringing change to environmental conditions, which not only affects existing businesses, but additionally the possibilities of new business creation and entrepreneurship (Naudé & MacGee, 2009; Gries & Naudé, 2010). In particular, the last seven years of evolution in the Spanish economy (table 1) have been characterized by a first stage with some growth until reaching, at the start of 2008, a turning point caused by the international crisis and the peculiarities of the national situation. After 2008, a series of periods characterized by stagnating and declining GDP and sustained unemployment rate increases followed one after the other (figure 1). All this portrays two different stages in the economic cycle: one expansive stage or that of growth until the end of 2007, with maximum peaks, then followed by a second recessionary or contracting stage, one that we find ourselves in yet today.

A progressively worsening situation like that shown by the GDP data is a reflection of a decline in economic activity, which, regarding entrepreneurship, directly translates into a reduced need or demand for new businesses, in addition to indirectly acting by affecting people in their confidence in the expectations when evaluating or considering putting a business initiative into motion. Naudé & MacGee (2009) argue, in this sense, that the recession and slowing growth in developed economies reduce opportunities, causing businesses to fail and fewer new initiatives to be launched, but the full effect on self-employment may be ambiguous due to reduced opportunity costs and reduced competition, which, on the other hand, can also facilitate access to business activity.

Table 1. Economic situation and environmental confidence indicators

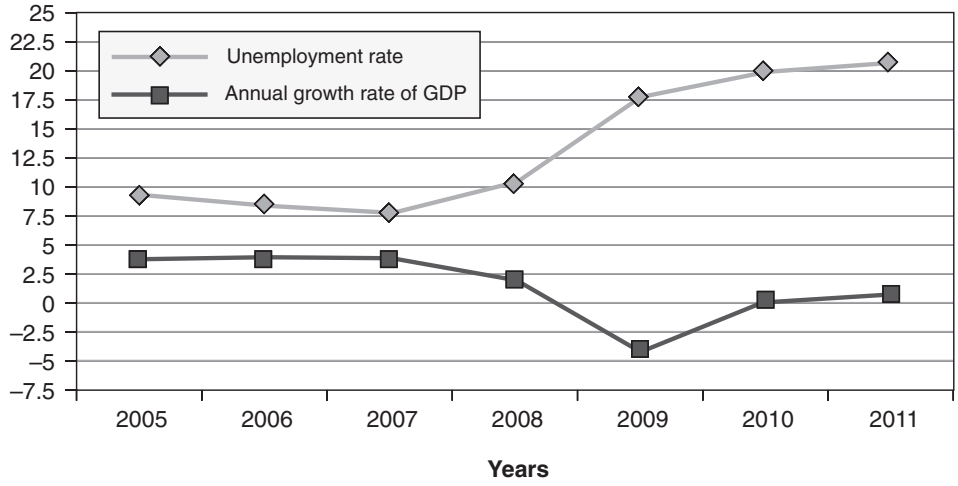
Indicator [1]		*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
GDP variation [2]	Quarterly	0.9%	1.0%	0.8%	0%	–1.1%	0.3%	0.2%
	Annual	3.7%	4%	3.7%	1.9%	–4.4%	–0.0%	0.7%
Unemployment rate		9.33%	8.53%	7.95%	10.44%	17.92%	20.09%	20.89%
Nascent entrepreneurial activity	Registered rate	2.4%	3.0%	3.5%	3.3%	2.3%	2.2%	3.3%
	Annual variation	+14.3%	+25.0%	+16.7%	–5.7%	–30.3%	–4.4%	+50.0%
Consumer Confidence Index (CCI) *Values from 0 to 200. Neutral value: 100*		91.2	84.9	93.4	57.3	64.0	65.9	74.9
Business Confidence Index (BCI) *Values from –100 to +100*		+7.2	+9.5	+9.0	–12.6	–19.0	–14.8	–9.2
INDSUP (Individual perception to entrepreneurship index) *Values from 0 to 3*	Average	—	1.07	1.09	1.04	0.87	0.97	0.83
	Mode	—	1	1	1	0	1	0
	0/3	—	*33.8%*	*32.5%*	*33.5%*	*39.9%*	*34.6%*	*40.8%*
	1/3	—	*33.8%*	*34.8%*	*36.1%*	*37.3%*	*38.4%*	*38.4%*
	2/3	—	*23.8%*	*23.8%*	*23.5%*	*19.0%*	*21.8%*	*18.0%*
	3/3	—	*8.6%*	*9.0%*	*6.9%*	*3.8%*	*5.2%*	*2.9%*
CULSUP (Cultural support for entrepreneurship index) *Values from 0 to 3*	Average	1.72	1.77	1.79	1.71	1.52	1.69	1.81
	Mode	2	2	2	2	2	2	2
	0/3	*11.0%*	*12.9%*	*10.5%*	*11.9%*	*17.5%*	*12.9%*	*9.7%*
	1/3	*13.6%*	*24.3%*	*25.9%*	*28.3%*	*31.7%*	*27.8%*	*26.9%*
	2/3	*19.0%*	*36.3%*	*37.8%*	*36.9%*	*32.3%*	*36.1%*	*35.8%*
	3/3	*11.0%*	*26.6%*	*25.8%*	*22.9%*	*18.6%*	*23.2%*	*27.5%*

[1] The indicators on GDP, unemployment, CCI, and BCI are those registered in the second quarter of the years indicated so that they coincided in time with the dates the GEM APS survey was taken.
[2] Gross domestic product (GDP). Chained volume with the year 2000 as reference. Data corrected for seasonal and calendar effects. Units: rates.

Sources: GDP and unemployment rate, INE; CCI, Instituto de Crédito Oficial; BCI, Cámaras de Comercio – Servicio de Estudios; INDSUP, CULSUP, nascent entrepreneurial activity, GEM – Adult Population Survey (APS) Spain, 2005 to 2011.

Regarding unemployment, the rates shown also clearly indicate the change in the cycle. Its turning point also occurred in 2008, and the unemployment rate in 2011 was almost triple that of four years earlier. The effects of unemployment upon entrepreneurship can also be contradictory, from both an individual as well as a territorial perspective (Bergmann & Sternberg, 2007). From the first point of view, the pressure of self-employment may be greater in those out of work than in those employed, but

Figure 1. Annual growth of GDP and unemployment rate, 2005-2011



Source: Own elaboration.

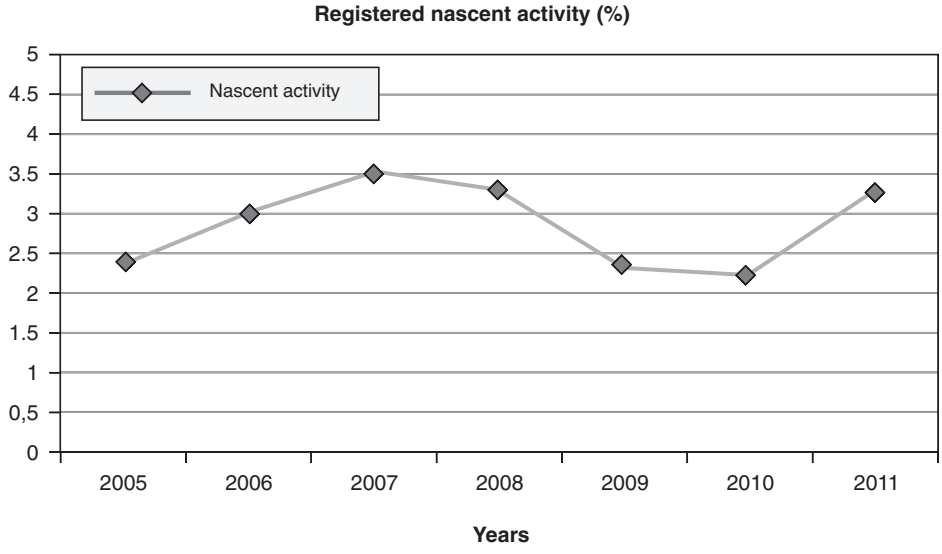
often they do not possess the necessary resources and skills. On a macro level, higher unemployment leads more to utilize self-employment as a way out; but then there is also less purchasing power on behalf of the population, and therefore, less demand, which in aggregate have a negative effect on the number of start-ups.

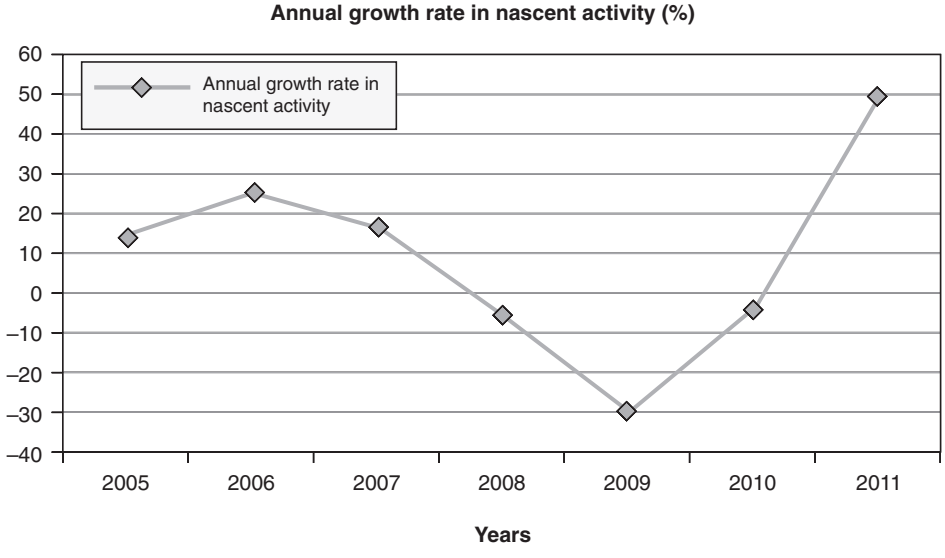
Within a framework like that described, the creation of businesses as an integral part of the economic reality has not been immune to this situation. Successive drops in the numbers of start-ups can be noted equally beginning in 2008 (GEM measures this nascent activity) until 2011, a year that despite bad economic data, such activity increased, basically due to the reduction in opportunity costs prompted by the deteriorating starting situation for many new entrepreneurs (table 1 and figures 2a & 2b).

In particular, the current economic crisis is an extreme situation, which like other extreme events related to natural disasters or manmade conflicts whether civil, military, or economic (Naude, 2010), eventually affect growth, development, and levels of uncertainty in the environment, which can influence people psychologically, affecting their cognitive processes of forming expectations and perceptions. In fact, these intangible psychological effects may become more important than the direct consequences that are visible or material (Brück *et al.*, 2010). In this sense, research like that by Marcu *et al.* (2012) presents an interesting process about how the influence of psychological factors on entrepreneurial tendencies can be seen affected in crisis environments, specifically using the internal locus of control as an example.

In this regard, specifically in Spain, various indicators (table 1) show how consumer and business confidence have suffered significantly with the changing cycle.

Figures 2a and 2b. Nascent activity registered in Spain and annual variation, 2005-2011





Source: Own elaboration.

Thus, the Consumer Confidence Index (CCI) shows that a situation close to neutral has shifted to an environment in which the public's perception regarding economic activity has deteriorated significantly. Additionally, the Business Confidence Index

(BCI) illustrates a scenario in which the perception of entrepreneurs concerning the situation has shifted from positive to negative, and this may influence their business behavior and the development of new projects.

Table 1 also contains two indices developed by GEM from the Adult Population Survey (APS) that try to bring together some cultural aspects used in studies that link culture with entrepreneurial behavior. In terms of the synthesis by Freytag & Thurik (2007), the INDSUP (Individual perception to entrepreneurship index) would be related to a series of added individual psychological features, in such a way that a higher proportion of persons possessing entrepreneurial values could lead to a higher proportion of entrepreneurs within a society. In turn, the CULSUP (Cultural support for entrepreneurship index) would be related to the degree of legitimization or moral approval —social norms— of entrepreneurship within a culture, in the sense of greater respect for the tasks of entrepreneurs, presence in the media and educational systems, etc., which could lead to an increased supply and demand of entrepreneurs. The comparison shows some reduction in the mean values of the individual component, modifying the distribution in the percentages of responses by the population towards 0 and 1 between the expansionary phase and first years of the contracting phase. This is in line with that stated in preceding paragraphs with respect to the psychological factors of individuals. The cultural component related most to social norms does not vary, which may be consubstantial to the fact that the comparison is made within the same territory of reference. Therefore, it can be assumed that no significant change has occurred either in the components of the socio-cultural environment or in the institutional framework, but rather, the influences on entrepreneurship deriving from the change in the environment would obey their economic component (Wennekers *et al.*, 2002; Freytag & Thurik, 2007).

In short, the cited indicators bring us to the investigated matter and reflect two distinct environments in the economic cycle, and the data suggest that the judgment about the economic climate made by individuals may have deteriorated, thereby also affecting the formation of perceptions related to entrepreneurial activity and their effects on business involvement [1]. Similarly, other aspects related to human and social capital may have seen their influence wane with the considerable change in the economic scenario of recent years.

3. Nascent entrepreneurs and determinants of business involvement

Generally, much research on entrepreneurship is carried out retrospectively, only including *business survivors* years after their creation. This carries the risk of introducing bias, like capturing characteristics and influences related more with business survival than with the decision to start a business, or incorporating mistakes in the

[1] Within the context of this paper, we understand the term *entrepreneurial involvement* as referring to the start-up and development of nascent entrepreneurial activity.

information due to memory loss or reinterpretations of facts due to the passage of time and transpiring events (Delmar & Davidsson, 2000; Davidsson & Honig, 2003). Furthermore, not incorporating information about individuals who failed in the process causes the loss of valuable information about the characteristics, attitudes, and circumstances that led them to try (Delmar & Davidsson, 2000; Gartner *et al.*, 2004; Johnson *et al.*, 2006).

All this recommends directing the research about the determinants towards what are called the early stages of the entrepreneurial process. In this regard, research focusing on these initial phases usually revolves around models of entrepreneurial intentions and nascent entrepreneurs (Autio *et al.*, 2001; Davidsson & Honig, 2003). However, these authors, along with Delmar & Davidsson (2000) and Krueger (2003), warn that the use of intentions exclusively is not without risk either, due to the danger of not distinguishing between *dreamers and doers*.

By keeping these aspects in mind, we consider it appropriate to focus this paper on nascent entrepreneurs, individuals who are taking steps to found businesses of their own, but who have yet to successfully finish this step of the process (Carter *et al.*, 1996), dealing with subjects who «start to commit time and resources to founding a new firm» (Reynolds & White, 1997; Reynolds, 2000).

About these individuals, several studies have analyzed the influence of elements of human and social capital and individual perceptions:

3.1. Influences of elements of human and social capital

The elements of human and social capital refer to the resources of individuals. They come in the form of educational baggage, experiences, and accumulated skills, in addition to networks of contacts, family history and, in general, close role models upon whom to focus, who exert their influence and provide vicarious experience.

As for educational levels, several authors point to an uncertain relationship in general (Greene, 2000; Blanchflower, 2004) due to their value by affording improvements in the capacity for self-employment, but also for employment by others (Crosa *et al.*, 2002). On the other hand, Shane (2003) provides a varied relationship of jobs where the educational level correlates positively with business involvement, justifying this relationship on the basis that the educational component increases the stock of skills and information that are influential in the exploitation of opportunities, and subtracts uncertainly in the assessment of the expected returns from the entrepreneurial activity. Likewise, within the GEM research context, various studies have also found positive effects on the probability of being a nascent entrepreneur (*e. g.,* Wagner & Sternberg, 2004; Arenius & De Clercq, 2005; Mueller, 2006).

On the other hand, personal knowledge of other entrepreneurs within the inner circle is the object of study in relation to entrepreneurial activity, mainly in terms of the social capital component (relationships or networks of entrepreneurs) and their positive influence as role models. In this sense, it provides a human capital compo-

nent, generating vicarious learning about exploiting opportunities through observing the behavior of others (Storey, 1994; Reynolds, 1997; Shane, 2003). Many studies have found positive effects on nascent entrepreneurship that derive from the presence of entrepreneurs within the family. Examples of these include Delmar & Davidsson, 2000; Davidsson & Honig, 2003; De Clercq & Arenius, 2003; Wagner, 2004; Wagner & Sternberg, 2004; Arenius & Minniti, 2005; Mueller, 2006; and Tamásy, 2006.

3.2. Influence of perceptual elements

The importance of perceptions for the nascent entrepreneur has been demonstrated fundamentally in the paper by Arenius & Minniti (2005), who understand them as subjective perceptual variables, occasionally partial, coming from the psychological and sociological literature, with importance in the decision, and that do not necessarily reflect objective circumstances. These types of variables have been dealt with in different models related to entrepreneurial activity, fundamentally in the literature related to intentions (Shapero & Sokol, 1982; Krueger & Carsrud, 1993; Krueger & Brazeal, 1994; Krueger, 2000 & 2003).

These models consider the perception of desirability as the degree to which the individual is attracted to a given behavior, and they tend to agree that it depends upon the expected results of the behavior (Degeorge & Fayolle, 2005; Brännback *et al.*, 2006). In this sense, individuals do not only perceive their own desirability towards business behavior, but they could also consider their fear of failure, and underestimate it. With respect to nascent activity, GEM research has analyzed this perception based on it being able to pose a barrier, and generally, a negative influence of this fear on the propensity to start a business was found (De Clercq & Arenius, 2003; Wagner & Sternberg, 2004; Arenius & Minniti, 2005; Lee *et al.*, 2005; Köllinger *et al.*, 2005; and Tamásy, 2006).

Concerning entrepreneurial opportunities, contributions by Venkataraman (1997), Shane & Venkataraman (2000), and Eckhardt & Shane (2003) have given a prominent role to their existence, detection, and exploitation. Similarly, models by Gnyawali & Fogel (1994), Verheul *et al.* (2002), and GEM (Reynolds *et al.*, 2005) have demonstrated the importance of the existence of surrounding opportunities, and their perception by the individual, for subsequent entrepreneurial initiatives. Regarding the analysis of nascent activity, this element has been frequently incorporated. In this manner, Alsos *et al.*, 2003; De Clercq & Arenius, 2003; Arenius & Minniti, 2005; Lee *et al.*, 2005; Köllinger *et al.*, 2005; Köllinger & Minniti, 2006; and Tamásy, 2006 find that the perception of future opportunities has a positive and significant effect on the decision to start a business.

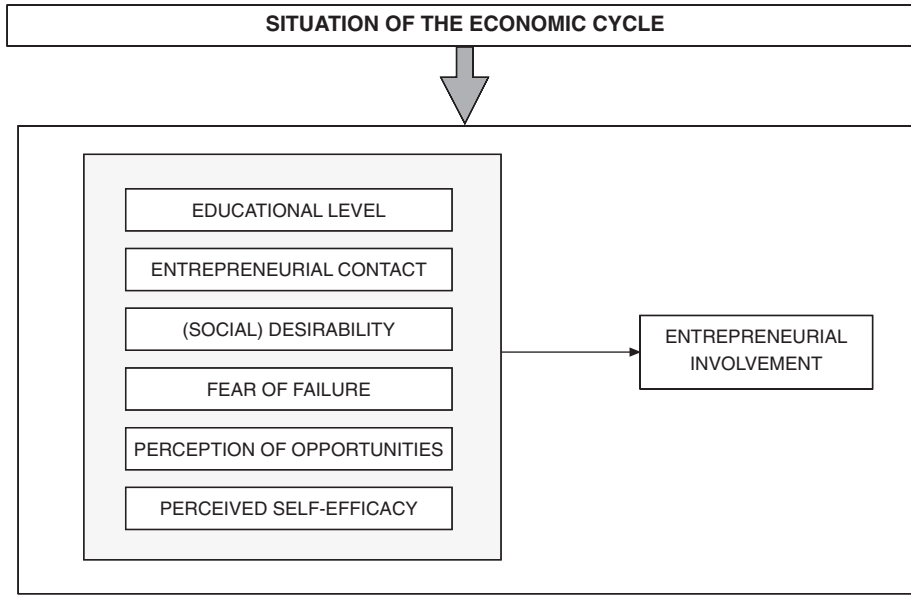
Perceived self-efficacy, an element highlighted by Shane (2003) as a psychological factor with influence on the aptitude for exploiting opportunities, is a variable centered on the individual that refers to the perception of one's capacity to execute and perform, and has been shown to be an element with positive influence on the generation of entrepreneurial intentions. Specifically, with regards to nascent activity, studies suggest a strong impact of self-efficacy on entrepreneurial propensity

(Diochon *et al.*, 2002; Alsos *et al.*, 2003; De Clercq & Arenius, 2003; Wagner, 2004; Arenius & Minniti, 2005; Köllinger *et al.*, 2005; Lee *et al.*, 2005; Köllinger & Minniti, 2006; Tamásy, 2006), with the perception variable usually highlighted most.

Socio-cultural elements, and in particular the beliefs and attitudes of the members of society in relation to the social desirability of entrepreneurial activities, are considered by Shane (2003) to be part of the institutional context. Within the scope of the principal theoretical models of entrepreneurial intentions, these aspects would form part of the so-called subjective (Ajzen, 1991) or social norms (Krueger & Carsrud, 1993; Krueger & Brazeal, 1994; Krueger, 2000; 2003) regarding the detected social pressure with respect to behavior, with influence on the development of the intention and subsequent entrepreneurial conduct. Within the GEM context, these questions have been introduced as subjective norms (Bruyneel *et al.*, 2006), socio-cultural norms of the institutional environment (Driga *et al.*, 2005), or approximations of social acceptance of entrepreneurial conduct and social legitimization of the employer (Tominc & Rebernik, 2007), without finding a clear significant relationship.

Based on that previously mentioned, this paper focuses on comparing the influence of the educational level, contact with entrepreneurs, social desirability, fear of failure, perception of opportunities, and perceived self-efficacy on nascent entrepreneurial activity. All of this is done within a broad timeframe that contemplates the changing phases of the economic cycle, testing the impact capacity of these determinants (figure 3).

Figure 3. Research approach



Source: Own elaboration.

4. Methodology

Data from Adult Population Surveys (APS) conducted in Spain between 2005 and 2011 were used for the empirical work under the consideration that they provide an appropriate reflection of two different economic climates marked by two different stages in the economic cycle. To do this, 2008 was taken as the year of inflection, with the three years immediately preceding it and the three following it examples of the two different directions of the cycle.

For the set of the seven analyzed years, 154,419 sample observations were used, whose detail per year is in table 2. The sample size for each year permits, working at a 95% confidence level and accepting as an assumption the hypothesis of maximum indetermination and infinite population, reaching some sampling errors for simple estimations that all vary between ±0.61 and ±0.82%.

The research focused on the study of nascent entrepreneurial activity [2], which acts as a variable to explain. Excluded from the sample were those individuals involved in any stage of the GEM entrepreneurial process different from this phase. The other variables selected are indicative of the baggage of human and social capital (educational level and knowledge of or contact with entrepreneurs) and perceptual variables (social desirability, fear of failure, opportunities, and self-efficacy). Also considered were the sociodemographic elements of age and sex as control variables. The Annex contains the questions, values, and classifications carried out on the population to operationalize all the variables.

Binomial logistic regression analysis, a generalization of the classic linear regression model applied to the case of categorical dichotomous variables, was selected as multivariate technique for the analysis.

In order to compare the periods under consideration, seven regressions with an identical approach and incorporation of variables, one for each year, were replicated. The method for the comparison was the Wald test [3] on the significance of the differences between the corresponding coefficients found in the different regressions, although for illustrative purposes and simplification, the same information was collected under a comparative graph of the odds ratios and their confidence intervals.

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[2] At GEM, individuals are classified as nascent entrepreneurs if they are carrying out activities that lead to starting a business, of which they will be the owner, at least in part, and furthermore, no wages have been paid for more than three months.

[3] The Wald chi-square statistic has one degree of freedom. Its formula is the following:

$$\frac{(\beta_1 - \beta_2)^2}{se(\beta_1)^2 + se(\beta_2)^2}$$

In it, the betas are logit coefficients estimated for each particular variable in two different years, taking the square of their difference as the numerator and the sum of the squares of the standard errors as the denominator. The results it provides are equivalent to those that would be obtained traditionally by the incorporation of a dummy variable of interaction that reflects the years being compared. Likewise, the graphic comparison of the overlaps between the ends of the confidence intervals provides the same information as to the existence of significant differences.

The data were subjected to a preliminary analysis in order to compare the conditions for using logistic regression, and they were properly verified. In each case, the sample size was superior to 10 ($k + 1$), with k being the number of explanatory variables, including all the dummy variables created. There were no zero frequencies in the contingency table compartments that cross the explanatory variables with the dependent variable [4] or collinearity recorded between variables. Moreover, and given that we are in a working scenario of «infrequent events» (King & Zeng, 2001a, 2001b; Weiss *et al.*, 2007) caused by the low appearance frequency of nascent activity in the samples used, in order to solve classification problems and avoid underestimating probabilities with respect to the positive state in the event of interest, the default cutoff point was modified by collecting and analyzing the ROC curves in the seven initial regressions, after which seven definitive regressions were reestimated.

5. Results

5.1. Descriptive analysis

Table 2 records, for the set of samples used, a decrease in nascent activity starting in 2008, until the upturn that occurred in 2011.

With respect to the educational level, as an objective descriptor of individual baggage, it registers a lower percentage of individuals at the middle level in all cases, while the weight change between the extremes responds better to the different way of computing this specific variable at GEM those years.

As for the remaining variables of interest, they show movements that responded to the different economic context between the years of the expansive phase in the cycle and those of the contractive phase, with the greatest brunt of these adjustments occurring in 2008 and 2009.

Thus, the perception of social desirability of the activity decreased slightly in 2008, and then with greater intensity when the individuals were surveyed in 2009, the year after the crisis was recognized. Particularly serious is the case of the perception of good opportunities for entrepreneurship in the environment, *i. e.,* the optimism with which the feasibility of developing an initiative is contemplated in terms of the possibilities of finding good opportunities. It began its descent in 2008, and by 2011, it hardly represented 40% of what it had in 2007. The fear of failure as a barrier, for its part, grew above the psychological threshold of 50% beginning in 2008. The presence of entrepreneurs who were personally known and who had started businesses up to two years prior starting decreasing in 2009, which is logical because the very number of people starting businesses also started falling that year. Only the recognition of self-efficacy remained at similar levels at all times, regardless of the phase of the cycle.

[4] In 2006, a frequency of 0.1% was registered in the cell that intersects the dependent value at its value of 1 (nascent entrepreneur) with the perception of self-efficacy at its value of 0 (lack of self-efficacy), which causes the estimation of an extraordinarily high coefficient in the logit, and the anomalous value that we find in its odds ratio.

Overall, the indices of listed nascent entrepreneurial activity, as well as the percentages for the variables related to entrepreneurial activity, clearly show the worsening situation.

Table 2. Frequencies of nascent activity and variables considered in the paper in the starting sample

No. (count)		*16,102*	*25,518*	*25,004*	*25,540*	*25,165*	*22,829*	*14,261*
Variables used		*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
Nascent activity [1]	*Yes*	2.7%	3.0%	3.8%	3.7%	2.1%	2.1%	3.5%
	No	97.3%	97.0%	96.2%	96.3%	97.9%	97.9%	96.5%
Sex	*Men*	45.6%	47.8%	48.6%	48.8%	47.5%	48.4%	46.7%
	Women	54.4%	52.2%	51.4%	51.2%	52.5%	51.6%	53.3%
Age	*Mean*	43.4	42.0	41.8	41.6	43.8	44.1	41.5
	SD	12.652	12.866	12.526	12.449	12.423	12.387	12.677
Educational level	*Low*	57.0%	57.1%	35.8%	34.1%	42.3%	41.0%	36.4%
	Middle	14.9%	16.9%	23.4%	21.5%	15.6%	14.2%	13.4%
	Higher	28.1%	26.0%	40.8%	44.0%	42.1%	44.8%	49.8%
Entrepreneurial contact	*Yes*	26.8%	32.4%	32.8%	36.0%	27.2%	27.1%	25.1%
	No	73.2%	67.6%	67.2%	64.0%	72.8%	72.9%	74.9%
Social desirability	*Yes*	71.4%	70.1%	71.0%	68.0%	61.1%	65.5%	66.8%
	No	28.6%	29.9%	29.0%	32.0%	38.9%	34.5%	33.2%
Fear of failure	*Yes*	49.7%	47.7%	49.6%	52.5%	54.1%	46.7%	53.7%
	No	50.3%	52.3%	50.4%	47.5%	45.9%	53.3%	46.3%
Opportunities	*Yes*	35.8%	32.1%	33.1%	24.7%	15.2%	16.7%	13.6%
	No	64.2%	67.9%	66.9%	75.3%	84.8%	83.3%	86.4%
Self-efficacy	*Yes*	41.1%	44.8%	44.3%	43.5%	43.2%	43.2%	43.1%
	No	58.9%	55.2%	55.7%	56.5%	56.8%	56.8%	56.9%

[1] The percentages differ from those shown in Table 1 because, in order to suitably capture the influence of the determinants arising in the regression, excluded from the sample was any individual involved in any phase of the entrepreneurial process different from that of nascent.

Source: APS Spain, 2005 to 2011, nascent entrepreneurs and individuals without any entrepreneurial activity.

5.2. Logistic regression analysis

Table 3 shows the final seven models of estimated logistic regression in order to observe the influence of the proposed explanatory variables on the entrepreneurial involvement throughout the analyzed period with *ceteris paribus* consideration. This

Table 3. Logistic regression for nascent entrepreneurial activity (2005-2011)

	2005	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
	Exp (β) (SE)	*Exp (β) (SE)*	*Exp (β) (SE)*	*Exp (β) (SE)*	*Exp (β) (SE)*	*Exp (β) (SE)*	*Exp (β) (SE)*
AGE	**1.069 (0.034)	***1.086 (0.026)	*1.045 (0.023)	**1.047 (0.022)	***1.120 (0.032)	***1.183 (0.034)	***1.155 (0.034)
AGE SQUARED	**0.999 (0.000)	***0.999 (0.000)	**0.999 (0.000)	**0.999 (0.000)	***0.998 (0.000)	***0.998 (0.000)	***0.998 (0.000)
GENDER (MALE)	**1.306 (0.115)	***1.385 (0.091)	***1.439 (0.085)	^1.103 (0.079)	***1.479 (0.105)	***1.441 (0.108)	**1.239 (0.107)
EDUCATION	^	*	^	^	^	^	*
Education (low/higher)	^0.834 (0.127)	^1.052 (0.101)	^1.072 (0.101)	**0.816 (0.098)	**0.781 (0.123)	^0.879 (0.121)	^0.851 (0.132)
Education (middle/higher)	^0.884 (0.168)	*0.803 (0.127)	^0.967 (0.103)	^0.901 (0.104)	^0.969 (0.137)	^0.908 (0.153)	^1.265 (0.153)
ENTREPRENEURIAL CONTACT	***1.950 (0.117)	***1.532 (0.090)	***1.761 (0.085)	***1.754 (0.082)	***2.265 (0.103)	***2.344 (0.106)	***2.726 (0.107)
SOCIAL DESIRABILITY	**0.766 (0.121)	**0.825 (0.094)	***0.763 (0.086)	**0.822 (0.084)	*0.832 (0.102)	*0.819 (0.105)	^0.980 (0.110)
FEAR OF FAILURE	***0.497 (0.130)	***0.591 (0.096)	***0.523 (0.089)	***0.520 (0.085)	***0.412 (0.111)	***0.538 (0.113)	***0.541 (0.111)
OPPORTUNITIES	***1.921 (0.117)	***1.596 (0.089)	***1.679 (0.083)	***2.296 (0.081)	***2.331 (0.105)	***2.127 (0.108)	***2.724 (0.116)
SELF-EFFICACY	***6.288 (0.170)	***51.871 (0.321)	***11.382 (0.150)	***9.620 (0.132)	***11.222 (0.193)	***8.887 (0.178)	***6.059 (0.151)
CONSTANT	***0.003 (0.707)	***0.000 (0.592)	***0.004 (0.484)	***0.004 (0.465)	***0.001 (0.649)	***0.000 (0.698)	***0.001 (0.658)

Hosmer-Lemeshow goodness of fit test	X^2 5.559 (Sig. 0.697)	X^2 4.807 (Sig. 0.778)	X^2 8.301 (Sig. 0.405)	X^2 2.417 (Sig. 0.966)	X^2 9.315 (Sig. 0.316)	X^2 11.992 (Sig. 0.152)	X^2 10.171 (Sig. 0.052)
Concordance: Area under ROC curve (C-statistic)	*0.810*	*0.833*	*0.811*	*0.813*	*0.850*	*0.834*	*0.826*
Concordant pairs	*80.3%*	*82.1%*	*80.6%*	*80.8%*	*84.0%*	*82.6%*	*82.1%*
Discordant pairs	*18.3%*	*16.5%*	*18.4%*	*18.1%*	*14.3%*	*15.8%*	*16.8%*
Tied pairs	*1.4%*	*1.4%*	*1.0%*	*1.1%*	*1.7%*	*1.6%*	*1.1%*
Percentage of hits	*75.6%*	*65.8%*	*62.2%*	*63.8%*	*73.6%*	*70.0%*	*73.5%*
Specificity (TNR)	*75.7%*	*64.8%*	*60.8%*	*62.7%*	*73.4%*	*69.7%*	*73.3%*
Sensitivity (TPR)	*72.0%*	*90.5%*	*89.5%*	*86.3%*	*82.8%*	*83.1%*	*78.0%*
Prevalence (nascent %)	*3.32%*	*3.69%*	*4.99%%*	*4.63%*	*2.30%*	*2.29%*	*3.86%*
Optimal cutoff point	*4.60%*	*4.34%*	*4.23%*	*3.89%*	*2.63%*	*2.25%*	*4.03%*

Exp (β) must be interpreted as how more or less likely it is to occur the event of interest expressed in the dependent variable by the fact of having the characteristic that contains the independent variable (1) versus not having it (0), whichever is greater or less than 1, respectively. If it is exactly equal to 1, the independent variable in question does not exert any influence on the dependent variable.
*In the Exp(β): ***sig<0.01; **sig<0.05; *sig<0.10; ^sig>0.10.*
Hosmer-Lemeshow test significance > 0.05 implies good calibration of the model.
C-statistic: 0.50 discrimination capacity null; 0.70-0.79 acceptable; 0.80-0.89 excellent; ≥0.90 exceptional.
The prevalence refers to the distribution of the total observations incorporated in the analysis in response to the event of interest. In this case, it indicates the percentage of individuals with nascent entrepreneurial activity from the total of individuals who were included in the analysis for each period considered.
The optimal cutoff point is obtained as the one that maximizes the specificity and sensitivity sum.

means they analyze the impact of each of the proposed variables on the likelihood of developing nascent entrepreneurial activity, but keeping the effect from the remaining variables controlled.

The regressions show the odds ratios associated to the estimated coefficients, as well as the significance linked to the respective Wald statistics for each coefficient, and the standard error.

As for the validity of the estimated models, these show a good degree of calibration with the data based on the result of the Hosmer-Lemeshow goodness of fit test. Furthermore, the estimated areas under the ROC curve (all above 80%) indicate very good discrimination ability, with a high degree of concordance for all the possible mixed pairs of cases [5]. Additionally, the percentages of hits offer, for the optimal cutoff point in each case, a high predictive power for the nascent activity event [6].

With regard to the variables of interest in the present work, in all the regression models the significance attached to the Wald statistics for each coefficient indicates that the fear of failure, perception of opportunities, perceived self-efficacy, and knowledge of entrepreneurs were significant for the target level of 5%, with the first influencing entrepreneurial involvement negatively, and the last three positively, especially the perception of self-efficacy. The perceived social desirability had lower levels of significance, with negative influence compared to what is commonly expected, and in the last year analyzed it ceased to be significant. As for the educational level, it was not significant for the 0.05 level in any of the estimated models.

For their part, the control variables are significant in all the estimated models with the exception of gender in 2008 (a year in which male nascent activity was seen especially affected by that female), showing typical results that, in the case of age, suggest an inverted *U* shape, and for gender, greater male entrepreneurial propensity than the female variety.

6. Comments on the results

Starting with the variables proposed in relation to human and social capital, these registered different types of behavior. The educational level fails to be significant for a level of 5%, so the fact of possessing different baggage does not seem to have

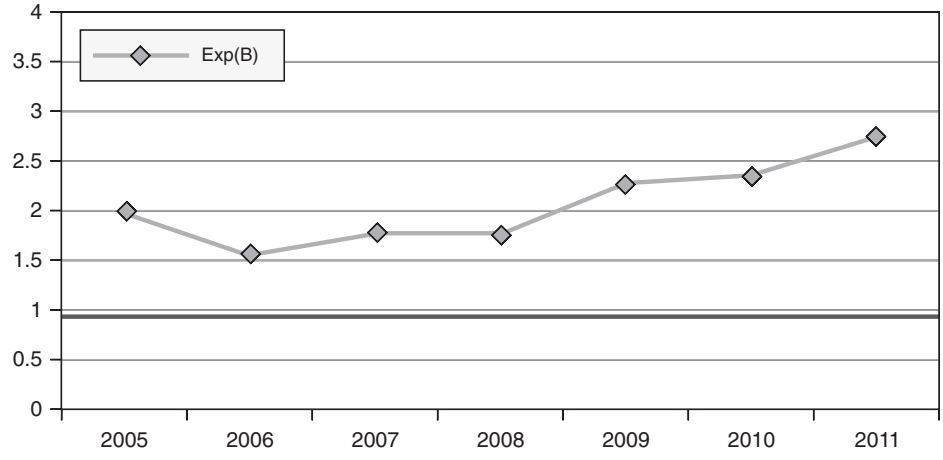
[5] The graphic representation of all the possible cutoff points on two axes (sensitivity and 1-specificity) defines the ROC curve. The area under the curve (AUC) indicates, for all the possible combinations of pairs of individuals in which one shows the event but the other does not, the probability of being assigned a higher probability of the event to which, effectively, indeed shows. This means that it approximates the probability of correctly classifying a pair of individuals (one 1 and one 0) chosen at random. It is the best instrument indicative of the discrimination ability of a pattern, given that, moreover, is not affected by modification of the cutoff point.

[6] The optimal cutoff or diagnostic point is defined as that offering a better sensitivity/specificity pair.

a clear relationship with entrepreneurial involvement. In any case, this result is not surprising given the variety of registries gathered in previous research, which point to a generally uncertain relationship (Blanchflower, 2004).

Knowledge of recent entrepreneurs, for its part, shows how this is usually a positive influence at all times, which appears to increase with the change in the stage of the cycle, and as this stage is more negative. Thus, we observed how the estimated odds ratio for this variable progressively increased from 2009 to 2011, as compared to 2008 and years previous, until reaching a central value of 2.72 in 2011, indicating that the presence of role models can make entrepreneurial propensity almost triple. These data are of interest in that they suggest that the presence of recent entrepreneurs within nearby surroundings appears to become progressively more influential in entrepreneurial involvement when facing ever more adverse economic contexts.

Figure 4. Odds ratio for knowledge of entrepreneurs, 2005-2011

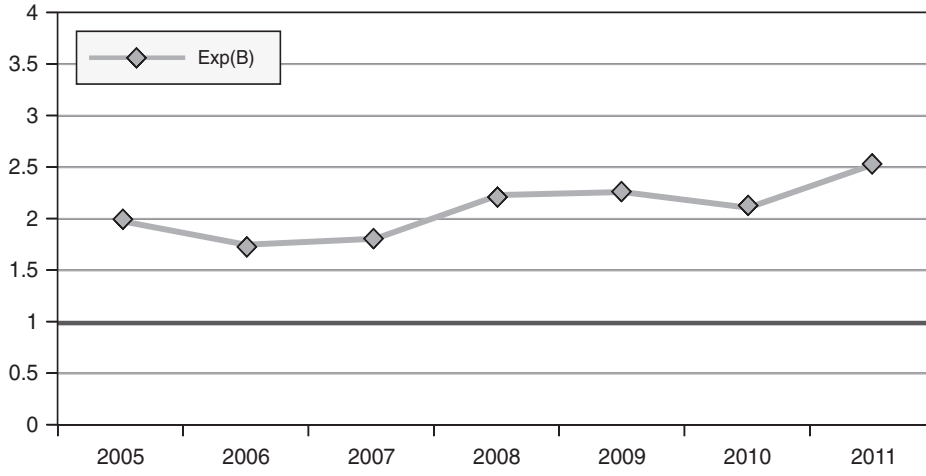


Source: Own elaboration.

Concerning the behavior of the variables of perception, both their significance and their direction of influence remain unchanged over time (with the exception of the perception of social desirability), however showing interesting nuances that are discussed next.

The evolution of the odds ratio for recognizing business opportunities indicates that this perception increases its influence on entrepreneurial decision-making during negative phases of the economic cycle, although significant differences can only be spoken of properly between 2006-2007 and 2011. In this manner, it could be felt that the identification of opportunities acts more strongly on entrepreneurial involvement during adverse stages than stages with better economic conditions.

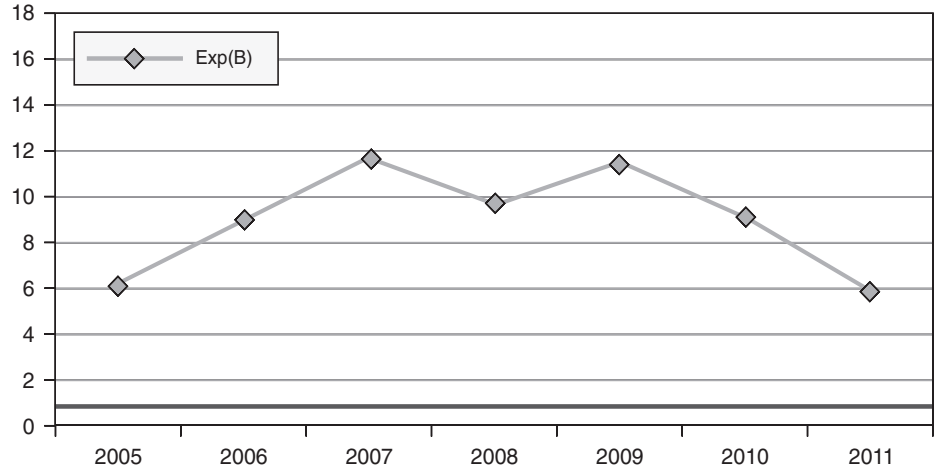
Figure 5. Odds ratio for perception of opportunities, 2005-2011



Source: Own elaboration.

Perceived self-efficacy is by far the most notable factor in all the cases; however, it is felt that its impact is reduced with the change of stage of the cycle (from 11.38 in 2007 to the 6.05 registered in 2011, a difference that between these two years becomes significant). Therefore, the deepening of the negative phase of the economic cycle and the prolongation of the crisis may ultimately undermine part of this self-confidence with respect to its influence on entrepreneurship.

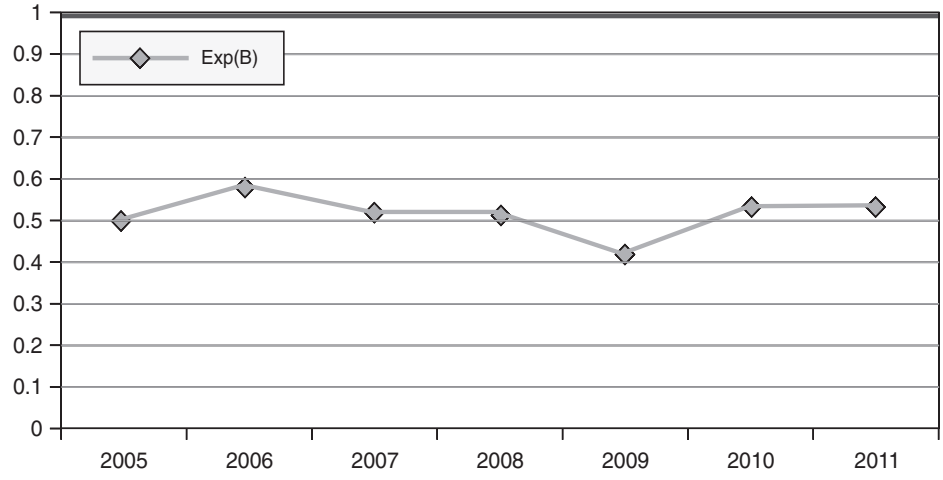
Figure 6. Odds ratio for perceived self-efficacy, 2005-2011



Source: Own elaboration.

The perception of the fear of failure as a barrier maintains its negative influence, without significant differences, in such a way that entrepreneurial propensity can be reduced by approximately one-half regardless of whether the economic context is positive or negative in nature. This result could attract attention, as a more negative influence in adverse contexts might be expected. However, the registry obtained seems to indicate that the progressive deterioration in the starting point for new entrepreneurs reduces opportunity costs of business involvement, which could have a hand in the influence remaining without significant differences.

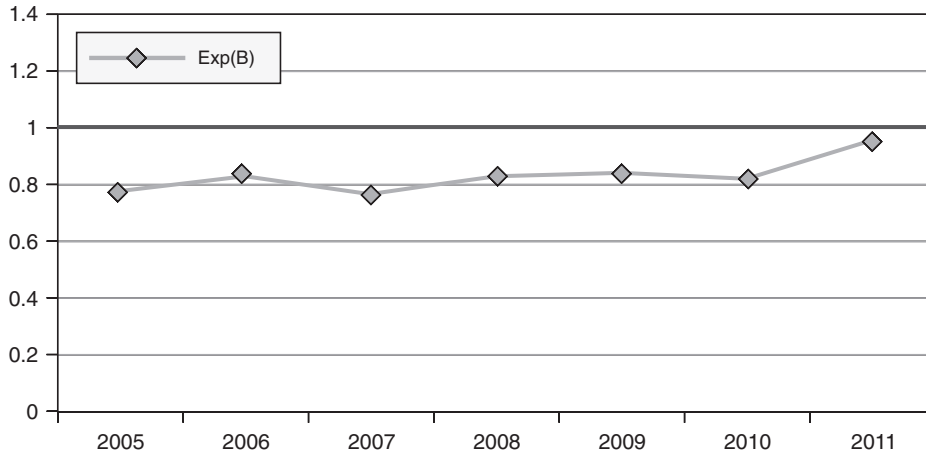
Figure 7. Odds ratio for fear of failure as a barrier, 2005-2011



Source: Own elaboration.

Finally, the perception of social desirability, with a negative influence until 2008, ceased being significant for the 0.05 level from 2009 onwards. The results for this item certainly seem contradictory given that in the literature it is often linked positively with the development of entrepreneurial intentions. In this sense, significant results with these variables were not found in any studies revised within the GEM context, and in particular, Tominc & Rebernik (2007) point out some thoughts and concerns about the wording of these questions in the APS survey. In fact, the response rates obtained for this question in the analyzed sample offer significant differences for the *yes* response, favorable to individuals who do not engage entrepreneurially, which explains an apparent negative influence of the perception of social desirability until 2011. Beginning that year, the response rate differences become diluted as nascent entrepreneurs gain greater recognition as the population considers entrepreneurial activity desirable, perhaps due to the its greater merits in times of crisis.

Figure 8. Odds ratio for perception of social desirability, 2005-2011



Source: Own elaboration.

7. Conclusions

This work is based on an extensive temporal comparison of GEM data of elements that are influential in the individual decision to start a business, with the conviction that studying entrepreneurial activity in a territory, under decidedly different stages of the economic cycle, may contribute to improve the understanding of the determinants of entrepreneurial activity.

Used for this was data belonging to the GEM research consortium in Spain that resulted from APS surveys carried out between 2005 and 2011. By focusing the study on nascent entrepreneurs, bias linked to retrospection was minimized (Davidsson, 2006).

The results reinforce the importance of the role of the variables of perception and role models as determinants of entrepreneurial activity, regardless of the *state of the environment* effect. This is in line with several studies, among which Arenius & Minniti (2005), Köllinger *et al.* (2005), and Minniti & Nardone (2007) are found. These authors mention the agreement of a growing number of investigators who classify the cited elements among the most important inducers of entrepreneurial behavior, describing their influence in the decision as universal. In this sense, this paper contributes important reinforcement to the evidence on this matter, while the above variables have collected results with the same significance and sign of influence, having replicated the analysis on seven occasions, with seven different samples, which moreover were collected at objectively different moments of the economic cycle.

In particular, the influence of perceived self-efficacy is shown as a key factor, which is related to that raised by the generality of models of intentions and other research on nascent activity (McGee *et al.*, 2009). In this sense, we agree with Minniti

& Nardone (2007: 236) when they affirm, «the perception of having sufficient skills is a dominant variable that seems to have an effect regardless of institutional settings, culture and overall level of entrepreneurial activity». In any case, although our results indicate that judging one's own capacity positively is the factor with a greater associated influence coefficient regardless of the context, it seems that a certain reduction of this influence is glimpsed in a context of economic difficulties.

The results also emphasize the importance of detecting opportunities. Considering the environment a source of opportunities increases entrepreneurial propensity in general, especially in adverse contexts. In fact, during the contracting phase of the cycle, this factor registers influences superior to those found during the growth phase, showing significant differences. This can be related to the fact that potential entrepreneurs are more likely to decide to exploit a business opportunity when the *gap* between the expected return of this option and other alternative uses of their time is greater (Shane, 2003), so that when an opportunity is recognized, individuals with lower opportunity costs (unemployment, lower household income) will be more inclined to exploit it (Amit *et al.*, 1993). The crisis and worsening of the negative phase of the economic cycle have deteriorated the average economic and labor situation of the population in aggregate terms, so it is expected that the average opportunity cost is less and the recognition of opportunities increases its influence.

This means that in hostile economic environments, like the present, the availability of mechanisms necessary for helping individuals, containing both information about potential business within their environment as well as tools to identify and judge the feasibility of such opportunities, becomes even more important.

In this regard, a notable element is called vicarious learning. Its importance in entrepreneurial propensity is clear, in that contact with other entrepreneurs can almost triple it. Furthermore, its importance is even greater in the sense that it also influences indirectly, as knowledge of recent entrepreneurs and the influence these can exert on those who have yet to become them (either by facilitating contacts and networks, learning from the experience of others, imitation, or the *if somebody else has done it, so can I*) have often been highlighted as a source of self-efficacy in several studies (Bandura, 1986). Similarly, it is also related to the perception of opportunities (Shane, 2003; Ramos-Rodríguez *et al.*, 2010).

In this element, the scenario analysis performed also shows that its importance is especially patent in the negative phase of the economic cycle, when it is noticed that the influence of the knowledge of entrepreneurs on entrepreneurial propensity is progressively greater, to the point of registering data significantly different from those collected in the positive phase. Individuals find greater support in networks of contacts and nearby role models. Thus, if the promotion of policies supporting the entrepreneur and networking among businesses and entrepreneurs comes to be practiced by many governments, the evidence provided indicates that this policy is especially relevant in economic environments of crisis and recession like the current one.

Another element traditionally linked to entrepreneurial involvement, but in the negative sense, is the risk of doing business, of which GEM has obtained an approxi-

mation with the fear of failure as a possible barrier. This paper adds to the generality of those who have obtained empirical support in this sense by showing it as a deterrent to entrepreneurship. Moreover, in the two analyzed contexts, its influence remained unchanged. In a crisis environment, an expected higher barrier could have been offset by the fact that further deterioration in the entrepreneur's starting position would reduce the opportunity costs of the entrepreneurial decision, which would also reduce the barriers caused by fearing the consequences of a hypothetical failure.

Overall, the results show, on an exploratory basis, the interest in studying in depth the behavior of these influencing factors in objectively different economic contexts. In this regard, future research could confirm the different intensities detected, and at the intensities that some factors affect decision-making in each scenario, by incorporating more extensive temporal samples into the research, using data from upcoming years, as well as their possible replication in other territories.

Nevertheless, this paper provides empirical evidence that supports the importance of establishing policies that encourage the development of actions to raise self-efficacy within the population and facilitate the recognition of opportunities and access to them, as these elements have shown significant influence regardless of the environment we find ourselves in. In this sense, strengthening social networks and promoting knowledge of and contact with entrepreneurs also become essential objectives, not only because of their direct influence, but also because of their indirect effects. The nuances found in relation to the different economic climates in which the analysis was replicated reinforce this idea, and demonstrate the importance of adapting promotional actions to the situation at all times.

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Annex. Operationalization of variables

Nascent activity

In order to be identified, all individuals are asked: (1) *«Are you, alone or with others, currently trying to start a new business, including any self-employment or selling any goods and/or services to others?».* Those answering affirmatively are inquired about: (2) *«Over the past 12 months, have you done anything to help start this new business, such as looking for equipment or a location, organizing a start-up plan, working on a business plan, beginning to save money, or any other activity that would help launch a business?»*; (3) *«Will you personally own part of this business?»*; (4) *«Has the new business paid any salaries, wages, or payments in kind, including your own, for more than three months?».* For all questions, the individuals have the option of responding one of four ways: *Yes*, *No*, *Don't know*, or by not answering/refusing. In the subsequent classification of variables, a person is classified as a *nascent entrepreneur* if, in addition to question (1), he/she answers *Yes* for items (2) and (3), and *No* for (4) (SUBOANW variable = 1).

Explanatory variables

Table 4. Explanatory variables used: questions, values, and classifications (GEM APS - Spain 2007 and 2009)

Variables of interest	*Corresponding question in the APS survey*	*Values and classifications*
Knowledge of entrepreneurs (KNOWENT)	*Do you know someone personally who started a new business in the past two years?*	— Yes (1) — No (0)
Level of education (EDUC)	*What is the highest level of education that you have completed?* *Recoded by the surveying body from the original response obtained.*	— None or primary (1) — Lower secondary (2) — (Upper) secondary (3)
Social desirability (NBGOODC)	*In your country, most people consider starting a new business a desirable career choice.*	— Yes (1) — No (0)
Fear of failure (FEARFAIL)	*Would fear of failure prevent you from starting a business?*	— Yes (1) — No (0)
Perception of opportunities (OPPORT)	*In the next six months, will there be good opportunities for starting a business in the area where you live?*	— Yes (1) — No (0)
Perceived self-efficacy (SUSKILL)	*Do you have the knowledge, skill and experience required to start a business?*	— Yes (1) — No (0)

Table 4. *(continue)*

Control variables	*Corresponding question in the APS survey*	*Values and classifications*
Gender	*Sex of the person being interviewed*	— Male (1) — Female (0)
Age	*What is your current age in years?*	— Years

The questions are formulated for the entire sample. In addition to the response options listed in the table, the individuals could have answered *Don't know* or refused to answer, options that were considered missing values in all the questions.
As for age, its value squared was also used to identify nonlinear relationships between it and nascent entrepreneurial activity.
In the case of education, (1) indicates that they have none or at most have completed part of secondary education; (2) corresponds to a secondary degree; and (3) indicates education beyond secondary and higher education.

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Section ARTICLES

Investigaciones Regionales

Comparing subjective and objective indicators to describe the national entrepreneurial context: the Global Entrepreneurship Monitor and the Global Competitiveness Index contributions

Alicia Coduras *, Erkko Autio **

ABSTRACT: Entrepreneurship research is progressing towards the construction of indexes that integrate the information of the three predominant approaches: the entrepreneurial activity output; the population's entrepreneurial behavior, values and aspirations; and the context in which entrepreneurship takes place. In this study we compare the Global Competitiveness Index data, one of the objective sources of information selected among those recognized as descriptors of national contexts, with the national entrepreneurial context qualitative information provided by the Global Entrepreneurship Monitor. The main purpose of this research is to contribute to the knowledge of entrepreneurial context sources of information by opening a discussion around the usefulness and contribution that could make the Global Entrepreneurship Monitor source in this field, and to determine if it is recommendable to proceed to its formal validation in the short time. The obtained results evidence that the two sources do not overlap to the degree of substituting one by the other and that the Global Entrepreneurship Monitor provides relevant qualitative details about the state of entrepreneurial context that are interesting to complement the Global Competitiveness Index information. The conclusion is to recommend the formal validation of this source, being also necessary to make comparisons with other relevant sources and to clear up its role in the progress of the integrated indexes construction.

Classification JEL: M13; O1; O57.

Keywords: entrepreneurial context; entrepreneurial framework conditions; experts' survey; subjective and objective context information; GEM; GCI.

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Comparación de indicadores subjetivos y objetivos para describir el contexto nacional para emprender: las contribuciones del Global Entrepreneurship Monitor y del Índice de Competitividad Global

RESUMEN: La investigación sobre emprendimiento está avanzando hacia la construcción de índices que integran la información de los tres enfoques predominantes en esta materia: el resultado de la actividad emprendedora propiamente dicha; el comportamiento, valores y aspiraciones emprendedoras de la población, y el contexto en que se desarrolla el emprendimiento. En este estudio se comparan los datos del Índice de Competitividad Global —una de las fuentes objetivas de información seleccionadas entre aquéllas más reconocidas como descriptoras de contextos nacionales— con la información cualitativa acerca del estado del entorno nacional para emprender proporcionada por Global Entrepreneurship Monitor (GEM). El objetivo principal de este trabajo es el de contribuir al conocimiento de las fuentes de información sobre el contexto emprendedor, abriendo un debate en torno a la utilidad y la contribución que puede hacer Global Entrepreneurship Monitor como fuente de información en este ámbito, y para determinar si es recomendable proceder a la validación formal de la herramienta que utiliza en el corto plazo.

Los resultados obtenidos en esta investigación evidencian que las dos fuentes de información comparadas no se solapan hasta el punto de poder sustituir una por la otra, y que la fuente de Global Entrepreneurship Monitor, proporciona detalles cualitativos relevantes sobre el estado del contexto emprendedor que son interesantes para complementar los datos proporcionados por el Índice de Competitividad Global. La conclusión es recomendar la validación formal de la fuente de información GEM, así como la realización de comparaciones con otras fuentes de información relevantes, clarificando su papel en el avance de la construcción de índices integrados de emprendimiento.

Clasificación JEL: M13; O1; O57.

Palabras clave: contexto emprendedor; condiciones de entorno para emprender; encuesta de expertos; información contextual subjetiva y objetiva; GEM; GCI.

1. Introduction

The building of entrepreneurship indicators has been working until very recent dates in three main almost independent approaches that include: the measurement of the entrepreneurial activity scope (output approach); the analysis of the entrepreneurial behavior, values, attitudes and opinions on the working age populations; and the measurement or evaluation of the state of the context or entrepreneurial conditions faced by potential and effective entrepreneurs (Acs, Autio and Szerb, 2012).

The attention devoted by the entrepreneurship literature to each one of these parts does not appear as balanced and the context approach is perceived as some undervalued compared with the other two approaches (Lindmark, 2011). Nowadays, it

becomes necessary to consider more effort to evaluate the usefulness of the sources of information focused on the context and to determine their contribution to the entrepreneurial context description, because the entrepreneurship measurement is called to offer integrated information instead of independent parts of information.

Thus, the most recent entrepreneurship measurement trends highlighted, and are demonstrating with effective results, the need of joining the three independent approaches (output, behavior/attitudes/values and context) to build entrepreneurship integrated indexes. These indexes represent an extended view of the entrepreneurial phenomenon and facilitate the identification of its strengths and weaknesses, opening up possibilities for policies correction and promote more adequate actions, a task that is much more difficult to do if based on partial or fragmented information.

For the construction of integrated entrepreneurship indexes, it has been more widely discussed the selection of indicators on entrepreneurial activity and on behavior/values/attitudes than the selection of context descriptors. Thus, although there are no perfect indicators of each part of the entrepreneurship equation the integrated indexes are based in a selection of entrepreneurial activity indexes, in variables that represent the entrepreneurial attitudes and aspirations of the populations and in prestigious context descriptors. The most advanced integrated index is the Global Entrepreneurship and Development Index (GEDI) due to Acs and Szerb (2008). It is based in information provided by the Global Entrepreneurship Monitor (GEM) for the entrepreneurial activity and entrepreneurial attitudes and aspirations of the populations, and in information provided by the Global Competitiveness Index (GCI), the Doing Business Index (EDB) and the Economic Freedom Index (EFI) for the context part.

As most of the variables that can be used to build integrated indexes can be provided by the GEM project and as it appears that its source of information on the entrepreneurial context has not been considered as a contributor to integrated indexes in front of other sources, the aim of this paper is to open a discussion to analyze if the information collected by GEM to describe the entrepreneurial context can provide differential information regarding one of these other sources: the Global Competitiveness Index.

The general justification of the need of this type of research has been pointed out before: to improve the knowledge on the entrepreneurial context indicators, the information they give and their usefulness to allow researchers to make adequate selections when building integrated entrepreneurship indexes. But there are other relevant and concrete justifications. Thus, in first place it is important to clear up questions about if the GEM source of information on the entrepreneurial context can contribute to integrated indexes with differential information or if it not able to do so. In second place, as GEM collects subjective information instead of objective information on the entrepreneurial context, it is relevant to clear up questions around the possible relationship and usefulness of both types of indicators. Finally, it is important to find ways to establish comparisons among different sources of information on the context, and this research represents a methodological contribution to this field. In this sense, we point out that it would be desirable to compare the GEM context information with

all others mentioned above, but given the constraints of an academic paper, the comparisons must be individually addressed. We begin with the GCI because the EDB and EFI are, apparently, more related with very concrete parts of the GEM information while the GCI includes a larger number of common variables appearing as the most indicated to make a first general exploration.

To structure the present research the following sections include: a brief view on the importance of the national and regional context for entrepreneurship and the explanation of the methodology of the compared sources of information; the research hypotheses; the research methodology; the statistical analyses; the derived conclusions and the final discussion.

2. The relevance of the national and regional context in entrepreneurship research

Without taking into account the context, and its complexity, it is not possible to explain the great variations in the formation of new ventures that exist between industries, regions and countries, but also over time (Shane, 2008; GEM, 2006, and 2011).

The context for entrepreneurship has been discussed from different perspectives. Among others, Shane (2003) discusses sources of entrepreneurial opportunities in terms of technological changes, political/regulatory changes and social/demographic changes. Bowen and de Clercq (2008) analyzed how a country's institutional environment will influence the allocation of the entrepreneurial effort. In a study of the relationship between bureaucratic work environments and entrepreneurship Sørensen (2007) has revisited sociological approaches to entrepreneurship, and found support for a negative relationship between bureaucratic work environments and entrepreneurship.

From the cited examples, and many others, it is possible to state that studies of the relationship between the context and entrepreneurship are based on different theoretical perspectives and are focusing on different aspects of the entrepreneurial process. Some are focusing on the supply of entrepreneurial individuals, others on the origin of entrepreneurial opportunities or on contextual factors that support or hinder the exploitation of entrepreneurial opportunities. From this follows that analyses of the context for entrepreneurial ventures can be structured in many different ways based on different perspectives and theories depending on the purpose of the study. This is the main reason that justifies the need to progress in the knowledge and contribution made by the different sources of information on the entrepreneurial context to build integrated entrepreneurship indexes.

The context is very complex because the number of contextual factors is very large and because their importance varies depending on other factors as for example the level of national or regional development. Nevertheless, actually it seems accepted that a division of the environment for entrepreneurship is constituted by three main analytical sub-contexts: the economic, the political and the socio-cultural and

by three analytical levels: the global, the national and the regional/local level (Lindmark, 2011).

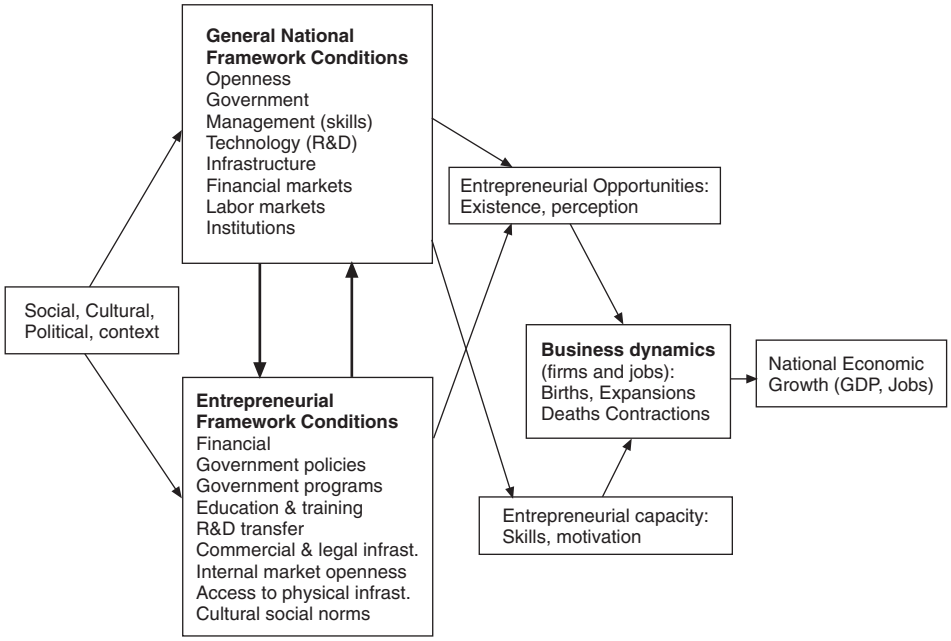
In the framework-institutional area, different types of measures can be identified. One approach surveys national experts thanks to a mail or online questionnaire to construct multi-item scales that reflect entrepreneurial framework conditions. The Global Entrepreneurship Monitor's National Expert Survey (Reynolds *et al.*, 2005) is an example of this since the year 1999. Another approach is the mixture of objective and subjective information provided by the World Economic Forum through the Global Competitiveness Indexes which relate key contextual factors with the countries' development level. More recently, there is another approach that compares the national regulatory framework for new business entry (Djankov *et al.*, 2002), which results in the widely used World Bank «Ease of Doing Business (EDB)» index. This source collects data on the regulatory framework which is relevant for the registration of new limited liability companies, focusing on highly tangible indicators of the regulatory environment such as the number of procedures required to register a new business; the number of days required to complete a new business registration; minimum capital requirement for new limited liability companies (as % of GDP per capita); procedures and cost to build a warehouse; creditor recovery rate in bankruptcy events and so on. Differently from other entrepreneurship sources of information, the EDB is invaluable in its specialty and, as it does not provide information on actual new firm creation, it constitutes the most appreciated general complement to objectively assess the state of the regulatory framework. Its most significant limitation is that the data is restricted to a «standardized» company that, among others is registered, employs from 5 to 50 employees within the first month of operation, and has sales turnover of up to 10 times seed capital (Djankov *et al.*, 2002). This means that the EDB framework conditions may or may not apply to well over 90% of the new firm population in any given country (Acs, Autio, Szerb, 2012). Related and building on this effort, OECD Entrepreneurship Indicators Program (EIP) has developed a more comprehensive framework measure that distinguishes between framework conditions, entrepreneurship performance, and economic impact (Ahmad and Hoffmann, 2008; Hoffmann *et al.*, 2006). This source is perhaps the most systematic and comprehensive approach to measuring entrepreneurship policy frameworks. It builds on and extends research into entrepreneurship policies initiated by the Danish government and policy research think tank FORA, and it also draws on the EDB, the World Bank Entrepreneurship Survey and the OECD's efforts to track various forms of new business registrations and exits. The core of the EIP approach is the framework conditions economic impact model developed by Ahmad and Hoffmann (2008; see also Nordic Council, 2010). In this model, entrepreneurship performance, understood as registration and growth of new limited liability companies) is regulated by entrepreneurship framework conditions. However, the link between framework conditions and entrepreneurship performance still remains a conjecture instead of a statistically established relationship and given the all-encompassing definitions employed to describe entrepreneurship, to demonstrate this statistical link appears as challenging (Ahmad and Hoffmann, 2008: 8).

Summarizing, while framework indicators provide useful benchmarks of the institutional and regulatory conditions that prevail in the economy, they lack connectivity with actual activity. In this perspective, an entrepreneurial country is one where the regulations and broader institutional conditions are supportive of entrepreneurial actions, regardless of whether such activity occurs and in which form. A further limitation of the regulations-focused framework indices is that they can only target registered activity, and the «standardized» approach overlooks up to the majority of self-employment attempts and new firm formations, depending on country (Acs, Autio and Szerb, 2012).

2.1. The contribution of the Global Entrepreneurship Monitor to the entrepreneurial context analysis and information

The initial GEM theoretical model (see figure 1), includes since the year 1999 a number of factors, social, cultural, and political, to assess the entrepreneurial context and under the statement that it can explain the opportunities existence, the entrepreneurial capacity of the population and, consequently, variations in entrepreneurship and national economic growth (GEM 2006 & 2011).

Figure 1. The first version of the GEM Theoretical Model, 1999



Source: Reynolds, Hay and Camp, 1999. Global Entrepreneurship Monitor: 1999 Executive Report. Babson, LBS and Kauffman Foundation.

To provide the section devoted to the entrepreneurial context with information, the GEM designers stated the year 1999, that there was not any international source available. This fact leads them to design an information tool which was the National Experts Survey (NES).

Taking in account the relevance of the entrepreneurial context as an essential part of the entrepreneurship research, the GEM's researchers built a source of information that, at least, took in consideration both some division of the context and the above mentioned levels when designed the experts' survey the year 1999. Thus, although it collects subjective information from selected experts, the core questionnaire includes batteries of statements on entrepreneurial financing, governmental policies, governmental programs, entrepreneurial education and training, R&D transfer, commercial and professional infrastructure, internal market openness, physical and services infrastructure and cultural and social norms, which attempts to assess on some of the main economic, political and socio-cultural aspects related to entrepreneurship. On the other hand, the GEM experts' survey can be applied to collect information from samples of experts at the global, national and regional or local level. These are points that indicate that much care was put in the design of this tool in a moment in which most of the present international sources of information considered as related to the context did not exist.

The NES attempts to contribute to the entrepreneurial context diagnostic each year providing evaluations made by a representative group of experts on batteries of items (statements) on each one of the entrepreneurial framework conditions included in the model (see figure 1). The statements are valued in Likert scales of five points and the groups of items were built under the assumption of constructs able to summarize each framework condition thanks to one or at least two unobserved factors. Thus, for example, the six items that experts evaluate on entrepreneurial financing (see figure 2) can be summarized (applying a principal components analysis) in one factor that represents the state of entrepreneurial financing in a territory. The same is done with the rest of groups of items on the rest of framework conditions. The result is that the GEM experts' survey collects wide qualitative information that is translated into summarized quantitative information.

The main critic to the NES methodology is about the validation of experts' surveys and about the subjective character of the collected information on the entrepreneurial context. In its defense, it is possible to argue that expert's surveys are used and accepted by several economic and social projects to assess the state of different contexts, when there are no other objective sources of information, being critical the methodological design, the experts' selection and the calculation of reliability measures. In this sense, GEM trains the participating teams on the experts' sample selection, asks for a sample proposal which is reviewed and approved when it meets the required quality about the adequacy of experts to each entrepreneurial framework condition, and calculates reliability measures (Cronbach's Alpha) to ensure that the qualitative information will result in the expected unobserved variables which will summarize the state of the entrepreneurial context. Since the year 1999, the GEM

Figure 2. An example of how the GEM's experts' survey collects information. The case of the entrepreneurial financing framework condition

Topic A: Finance	*In my country (or region, or city)*	*F*				*T*			
A01	There is sufficient equity funding available for new and growing firms.	1	2	3	4	5		DK	NA
A02	There is sufficient debt funding available for new and growing firms.	1	2	3	4	5		DK	NA
A03	There are sufficient government subsidies available for new and growing firms.	1	2	3	4	5		DK	NA
A04	There is sufficient funding available from private individuals (other than founders) for new and growing firms.	1	2	3	4	5		DK	NA
A05	There is sufficient venture capitalist funding available for new and growing firms.	1	2	3	4	5		DK	NA
A06	There is sufficient funding available through initial public offerings (IPOs) for new and growing firms.	1	2	3	4	5		DK	NA

Note: the scale goes from 1 (completely false) to 5 (completely true), plus don't know and not applicable responses. These six items are summarized in one applying principal components. The result is a quantitative variable that aspires to represent how favorable or unfavorable is the entrepreneurial financing condition in a territory.

experts' survey has worked well and responding to the design. Further validation actions are expected for the near future.

2.2. The contribution of the Global Competitiveness Index to the context analysis

Since 2005, the World Economic Forum (WEF) has based its competitiveness analysis on the Global Competitiveness Index (GCI), a highly comprehensive index for measuring national competitiveness, which captures the microeconomic and macroeconomic foundations of national competitiveness (Sala i Martin, Blanke *et al.,* 2010).

The WEF defines competitiveness as the set of institutions, policies and factors that determine the level of productivity of a country. By its side, the level of productivity states the level of prosperity that can be earned by an economy. As a result, more competitive economies tend to produce higher levels of income for their populations. Also, the productivity level is the main factor determining the rates of return obtained by physical, human and technological investments in an economy. As the rates of return are the key drivers of the growth rates of the economy, a more competitive economy is one that is likely to grow faster in the medium to long run.

The WEF analysts identify static and dynamic components of the competitiveness concept: although the productivity of a country clearly determines its ability to sustain a high level of income, it is also one of the central determinants of the returns to investment, which is one of the critical factors explaining and economy's growth potential.

To build the GCI, these analysts have been identified some years ago 12 pillars of the economic competitiveness. To identify these pillars, a wide study on the economists thinking has been made: from the Adam's Smith focus on specialization and division of labor, to neoclassical economists' emphasis on investment in physical capital and infrastructure, and, more recently, to interest in other mechanisms such as education and training, technological progress, macroeconomic stability, good governance, firms' sophistication and market efficiency, among others. The GCI captures this wide vision by including a weighted average of many different components, each measuring a different aspect of competitiveness. These components are those grouped into 12 pillars of economic competitiveness.

The 12 pillars are: institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labor markets efficiency, financial market development, technological readiness, market size, business sophistication and innovation. It is clear that some of these pillars are also identified by GEM as entrepreneurial framework conditions.

The GCI reports separately about each one of the 12 pillars, but their authors aware about how important is to keep in mind that they are not independent. In fact, they have demonstrated that they tend to reinforce each other and that a weakness in one area often has a negative impact on other areas. To illustrate this reality, a good example can be given. Thus, innovation (pillar 12), will be very difficult to develop without a well-educated and trained workforce (pillars 4 and 5), that are adept at absorbing new technologies (pillar 9), and without sufficient financing (pillar 8) for R&D or an efficient goods market (pillar 6) that makes it possible to take new innovations to market (pillar 10) (Sala i Martin, 2010).

The GCI consists in a single index in which pillars are aggregated and weighted, but it is important to note that the Global Competitiveness Report offers indicators for the 12 pillars separately, because the detailed information provides a sense of the specific areas in which a particular country needs to improve.

In line with the economic theory of stages of development (Rostow W. W., 1959, Porter, 2002), the GCI assumes that in the first stage, the economy is factor driven, and countries compete based on their factor endowments, that is, primarily unskilled labor and natural resources. The companies compete on the basis of price and sell basic products or commodities. These countries show low productivity and this is reflected in low wages. The competitiveness at this stage relies on the first four pillars: well-functioning of public and private institutions, well developed infrastructure, a stable macroeconomic environment and a healthy workforce that has received at least basic education.

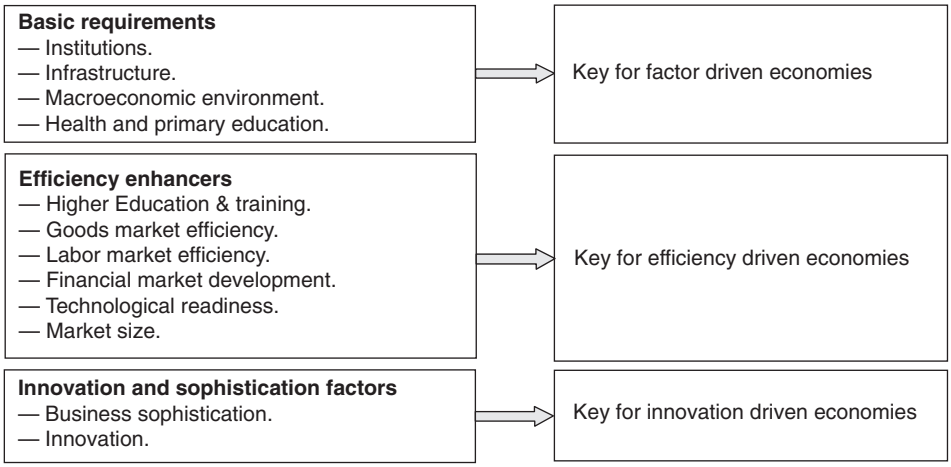
The second stage is achieved when a country becomes more competitive, productivity increases, wages rise and development advances. Nations that follow this process get the second stage of development that is named efficiency driven phase. In this stage, countries must begin to develop more efficient production processes and increase product quality, because wages have risen and they cannot increase prices. In this stage, competitiveness is increasingly driven by pillars from 5 to 10, that is:

higher education, efficient goods markets, well-functioning labor markets, developed financial markets, the ability to harness the benefits of existing technologies and a large domestic or foreign market.

The process is completed when countries move into the innovation driven stage. As countries reach this phase, wages will have risen by so much that they are able to sustain the associated standard of living only if their businesses are able to compete through new and unique products. Companies must compete producing new and different goods and services using the most sophisticated production processes, which involves pillar 11, and using innovation, which involves pillar 12.

The GCI incorporate the stages of development by attributing higher relative weights to those pillars that are more relevant for an economy (see figure 3), given its particular stage of development. Thus, although it is considered that all 12 pillars matter to certain extent for all countries, the relative importance of each one depends on a country's particular development stage. To implement this concept, the 12 pillars are organized into three sub-indexes: the basic requirements sub index (includes critical pillars for countries in the factor driven stage), the efficiency enhancers sub index (groups critical pillars for efficiency driven nations) and the innovation and sophistication factors sub index (that groups the critical pillars for innovation driven countries). These sub-indexes are shown in figure 3, and the weights attributed to each sub index in every stage of development, can be seen in table 1. These weights are obtained applying a maximum likelihood regression of GDP per capita against each sub index for past years. This system brings different coefficients for each stage of development and the rounding of these econometric estimates, led to the choice of weights displayed in table 1.

Figure 3. The 12 pillars of competitiveness and the stage of development as presented by the Global Competitiveness Report



Source: 2010-2011, Global Competitiveness Index Report, World Economic Forum.

Table 1. Weights of the three main sub-indexes at each stage of development

Sub index	*Factor driven stage (%)*	*Efficiency driven stage (%)*	*Innovation driven stage (%)*
Basic requirements	60	40	20
Efficiency enhancers	35	50	50
Innovation and sophistication factors	5	10	30

Source: 2010-2011, Global Competitiveness Index Report, World Economic Forum.

This same conceptualization has been applied to the GEM theoretical reviewed model since the year 2008 (GEM, 2008). The purpose of this change was to incorporate the economic competitiveness phases of the countries when the entrepreneurship and consolidated processes are analyzed by the observatory. So, nowadays, both GEM and the GCI base the classification of countries in their stages of development, using two criteria to allocate them. The first is the level of GDP per capita at market exchange rates (see table 2). This widely available variable is used in the GCI context as a proxy for wages, because it is internationally comparable and data on wages are not available for all countries. A second criterion measures the extent to which countries are factor driven. This can be calculated thanks to the share of exports of mineral goods in total exports (goods and services), under the assumption that countries that export more than 70 percent of mineral products (measured using a five year average), are to large extent factor driven. The nations falling between two of the three stages are considered to be in transition. The GCI analysts consider that, for these countries, the weights change smoothly as a country develops, reflecting the smooth transition from one stage of development to another. This allows these analysts to place increasingly more weight on the areas that are becoming more relevant for the country's competitiveness as it develops, ensuring that de GCI can gradually «penalize» those countries that are not preparing for the next stage.

Table 2. Income thresholds for establishing stages of development

Stage of development	*GDP per capita in US$*
Factor driven	< 2,000
Transition from stage 1 to 2	2,000-3,000
Efficiency driven	3,000-9,000
Transition from stage 2 to 3	9,000-17,000
Innovation driven	>17,000

Source: 2010-2011, Global Competitiveness Index Report, World Economic Forum.

For the year 2010, the classification of countries into stages of development is shown in table 3. We include those countries that participated both in the GEM national experts' survey and in the adult population survey this year. The GEM sample does not

include the same numbers of nations in the stages of competitiveness, and this is a limitation, as some of them could not be representative of the total GCI sample. Thus, at the end of the table, we show the total GCI number of nations in each stage the year 2010, and the percent that is represented by the GEM sample. Significant gaps can be detected in the two first groups. As the GEM project is mainly sustained by private sponsorship, it is easy to conclude that as the competitiveness' of nations increases, so do the odds to participate in the GEM project, although much advancement has been achieved in the field of developing nations sponsorship thanks to the commitment of diverse nonprofit institutions. Furthermore, the GCI is also a non-complete source of information and, like the GEM project, is trying to uncover the whole world, and despite its collection is wider than GEM in number of countries, they are some that could not still participate. The total number of countries reported by GCI was of 139 for the year 2010.

Table 3. GEM countries that participated in the national experts' survey the year 2010, classified following the GCI system

Factor driven (1)	*Transition 1-2*	*Efficiency driven (2)*	*Transition 2-3*	*Innovation driven (3)*
Bolivia	Angola	Argentina	Chile	Finland
Ghana	Egypt	Bosnia & H	Croatia	France
Pakistan	Guatemala	Brazil	Hungary	Germany
Palestinian S.*	Iran	China	Latvia	Greece
Uganda	Jamaica	Colombia	Taiwan	Iceland
Vanuatu*	Saudi Arabia	Costa Rica	Trinidad T.	Ireland
Zambia		Ecuador	Uruguay	Israel
		Macedonia		Italy
		Malaysia		Japan
		Mexico		Korea R.
		Montenegro		Norway
		Peru		Portugal
		Russia		Slovenia
		South Africa		Spain
		Tunisia		Sweden
		Turkey		Switzerland
				United Kingdom
				United States
N = 5 + 2(GEM)	N = 6 (GEM)	N = 16 (GEM)	N = 7 (GEM)	N = 18 (GEM)
N = 38 (GCI)	N = 25 (GCI)	N = 29 (CGI)	N = 15 (GCI)	N = 32 (GCI)
% = 13.1%	% = 24.0%	% = 55.2%	% = 46.4%	% = 56.2%

* Vanuatu and the Palestinian Settle did not participate in the GCI 2010 Report.

Source: data from GCI 2010 and GEM 2010.

2.3. The link between GEM and GCI

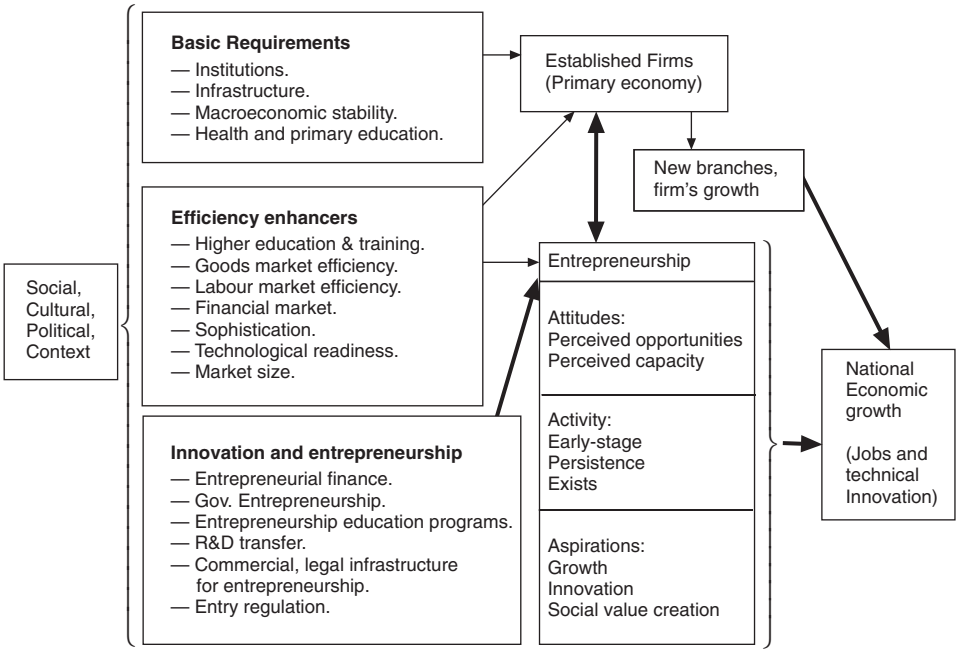
The year 2008, GEM Global Report authors (Bosma, Acs, Autio and Levie, 2008) considered very important to progress toward the construction of integrated indexes. They analyzed the interaction with other prestigious projects' information, especially the World Economic Forum's Global Competitiveness Report (GCR), and to consider more indicators that allow policy makers to better know what areas need more intervention to improve both: the entrepreneurial activity rate and its quality. This decision was justified because the GEM data evidenced that while important, the contribution of entrepreneurs to an economy also varies according to its phase of economic development (Acs, Audretsch, Braunerhjelm, Carlsson, 2003). As GEM growth, the data showed that the level of necessity-driven self-employment activity is high, particularly at low levels of economic development, as the economy may not be able to sustain a high enough number of jobs in high-productivity sectors (Bosma, Acs, Autio, Levie, 2008). As an economy develops, the level of necessity-driven entrepreneurial activity goes progressively down because productive sectors grow and begin to supply more employments. At the same time, opportunity-driven entrepreneurship tends to increase, and this introduces a qualitative change in the overall entrepreneurial activity. This process results in a U-shaped curve that demonstrates an association between entrepreneurship and economic growth, although the model cannot fully reflect the complexity of the causal relationship between the two concepts, and because the population entrepreneurial attitudes and the contextual variables take also part in the model. The 2008 GEM Global Report authors explained that in this document they introduced a more nuanced distinction among phases of economic development, in line with Porter's typology of factor-driven economies, efficiency-driven economies and innovation-driven economies (Porter, 2002). The outcome of this review was the revised GEM theoretical Model, showed in figure 4.

The differences between the first (see figure 1) and the revised model are evident, thus:

- The two sets of initial conditions (general framework and entrepreneurial framework), appear as substituted by the three groups of economy pillars used to build the three global competitiveness sub-indexes that integrate the overall competitiveness index (GCI) depending on the phase of economic development (see figure 4).
- The entrepreneurial opportunities and the entrepreneurial capacity perceptions' were integrated along with the entrepreneurial activity in a unique set of information devoted to entrepreneurship (see figure 4).

The first change stands the relevance of the development stages when measuring the entrepreneurial activity, but at the same time makes less clear where it is allocated the concrete measurement of the entrepreneurial context, an element considered as essential to build integrated entrepreneurship indexes. Thus, looking at the model, one could consider that the entrepreneurial context is included in the general context or that it has been substituted by the GCI pillars. If this is the case, then there is room

Figure 4. The GEM revised model



Source: GEM 2008, Bosma, Acs, Autio, Levie *et al.*

to test if at least part of the GEM information tool to assess on the entrepreneurial context could be substituted by the GCI pillars, which is the main subject of the present research.

The second change also represented an improvement and one of the necessary steps to progress in building integrated entrepreneurship indexes. Thus, it implies to agglutinate the information of the other two branches cited in the introduction, that is, the measurement of the entrepreneurial activity scope (output approach) and the analysis of the entrepreneurial behavior, values, attitudes and opinions on the working age populations.

Thanks to this model, GEM covers the main entrepreneurship research approaches. Now, it is necessary to clear up the role, usefulness and scope of the entrepreneurial context sources of information.

3. The research hypotheses

To progress in this clearing up, the concrete purpose of this research is to make a comparison between the GEM experts' survey and the GCI results as sources of information on the entrepreneurial context, to extract conclusions that help to clear

up if the first one can contribute to some degree to the building of entrepreneurship integrated indexes. As to compare both sources of information statistical methods must be applied, they have been established the following hypothesis:

H_{01}: The NES information on the national entrepreneurial framework conditions is able to classify the GEM participating nations in their respective GCI stages of competitiveness, that is, in factor-driven, efficiency-driven and innovation-driven economies (the stage of competitiveness depends to some degree on the EFCs state).

By testing this hypothesis we analyze if the subjective information given by GEM experts responds to some degree to the objective information given by the GCI on a general context concept, represented by the stage in which GEM countries are classified in terms of development and competitiveness.

H_{02}: The overall GCI has limited capacity to explain the summarized GEM experts' evaluation of the entrepreneurial framework conditions.

H_{03}: The GEM experts' summarized information has high capacity to explain the overall GCI.

By testing these hypotheses we establish if there exists some correlation between the GEM experts' summarized information and the overall GCI that is also a summary of information on the 12 pillars. The degree of correlation between the two sources of information informs about their overlap or complementarity, clearing up if they contribute to the entrepreneurial context description with similar or different information.

H_{04}: The GEM experts' survey information has high capacity to explain the GC sub-indexes that are critical for each stage of development.

Finally, by testing this hypothesis we refine the previous results taking in consideration the main stages of competitiveness as they also influence the entrepreneurial context.

4. Methodology

The research is based in two sources of data: the 2010 GEM national level edition by one side and the 2010-2011 Global Competitiveness Index Report by the other.

To test the research hypothesis, three types of techniques have been applied:

1) A discriminative analysis to prove that the GEM experts' data on EFCs are able to classify nations by their stage of competitiveness.
2) A multivariable general lineal model to test if the GCI can explain the main GEM data EFCs.
3) A stepwise multiple linear regression analysis to estimate to what point the GEM EFCs data can explain the overall GCI for the 2010 GEM countries.
4) A stepwise multiple linear regression analysis to estimate to what point the EFCs data can explain the GC sub-indexes for the 2010 GEM countries at each competitiveness stage.

As explained before, the overall Global Competitiveness Index is the result of three sub-indexes that consider three stages of competitiveness of countries, that is, the factor driven stage, the efficiency driven stage and the innovation driven stage. GEM adopts the same classification and in their files, the project includes a categorical variable to do so. There also exists another variable that considers the five possible groups, when the transition countries are described, but as the GEM sample is reduced compared with the GCR, in this research it is used the three categories variable. For the first hypothesis, the dependent variable is this one, and the explanatory variables are the summary quantitative variables that represent the state of the entrepreneurial framework conditions. As the statistical problem is to determine if the EFCs are able to classify countries, the adequate model is the discriminative.

A discriminative analysis creates a predictive model for belonging to a group. The dependent variable must be categorical with two or more categories that are considered groups of cases or individuals. The independent variables must be quantitative. When considering more than two groups, the model estimates a set of discriminative functions. These functions are based in linear combinations of the explanatory variables that provide the best possible discrimination among the groups. The functions are generated thanks to a sample of cases in which the group of pertinence is known. If the analysis can reproduce 75% or more of the original cases, it is considered as acceptable to predict the group of a new individual for who the group is unknown. The resulting canonical functions can be interpreted thanks to a matrix that provides their correlation with the original explanatory variables.

By its side, the general linear model can be used when several variables must act as dependent and the explanatory is a single variable. This is the case to test the second hypothesis because the problem is to see if the GEM quantitative variables that represent the state of the EFCs are able to explain the GCI. The generalized linear model expands the general linear model, so that the dependent variable is linearly related to the covariates by a particular link function. In addition, the model allows the dependent variable has a distribution that is not normal and covers the most commonly used statistical models. In research, it was selected to analyze a wide set of dependent variables at the same time. Thus, for the second hypothesis, the dependent variables are the GEM EFCs, a set of quantitative and continuous variables, and the independent variable is the overall GCI. The multiple version of the generalized linear model applies simultaneous regressions to all this set of variables, and offers the resulting coefficients as well as the goodness of fit for each case.

Finally, to test the third and fourth hypothesis, it has been considered enough to apply a stepwise multiple linear regression analysis, as the dependents are the GCI or the basic requirements sub index, the efficiency enhancers sub index and the innovation and sophistication factors sub index, while the explanatory have been the EFCs. They have been estimated four models: one for the GCI and the EFCs, one for the basic requirements sub index and the EFCs for the factor driven group of nations, another for the efficiency enhancers sub index and the EFCs for the efficiency driven nations and, the last for the innovation and sophistication factors sub index and the

EFCs for the innovation driven nations. The obtained results are offered in the next section.

5. Results

5.1. Discriminative analysis

To test the first hypothesis, data is composed by 54 nations that participated in the 2010 GEM NES survey. The EFCs are represented by quantitative continuous variables that include the average value of each nation on each condition. The competitiveness level of the nations is represented by a categorical variable in which the values 1, 2 and 3, are for factor-driven, efficiency-driven and innovation-driven nations respectively. There are 13, 23 and 18 nations in each group. Prior probabilities of group pertinence have been chosen as different, to minimize the impact of the different number of nations in each group. The analysis resulted in two canonical functions that captured the 100% of the variance. The first function captured the 76.4% of the information, and the second the remaining 23.6%.

Table 4. Results of the discriminative analysis of EFCs on GCR stage of competitiveness of GEM 2010 nations

Function	*Eigenvalue*	*% of variance*	*Canonical correlation*	
1	1.507	76.4	0.775	
2	0.464	23.6	0.563	
Functions test	*Wilks Lambda*	*Chi Square*	*F.D.*	*Significance*
1 to 2	0.272	50.173	24	0.000
2	0.683	17.352	11	0.098
Prior probabilities for each group: the option of different prior probabilities has been used due to the different number of cases in each original group: 0.214 (factor driven), 0.426 (efficiency driven), 0.333 (innovation driven).				
Original summary NES variables	*Structure matrix*		*Function 1*	*Function 2*
Government programs for entrepreneurs			0.529*	0.166
R&D level of transference			0.494*	0.082
Physical infrastructures and services access			0.457*	0.061
Government concrete policies, priority and support			0.206*	0.137
Financial environment related with entrepreneurship			0.187*	0.134
Government policies bureaucracy, taxes			0.145*	–0.141
Professional and commercial infrastructure access			0.143*	–0.019
Internal market burdens			0.128*	–0.048
Cultural, social norms and society support			0.023*	–0.016

Table 4. *(continue)*

Original summary NES variables *Structure matrix*	*Function 1*	*Function 2*
Entrepreneurial level of education at Vocational, Professional, College and University	0.024	0.526*
Entrepreneurial level of education at Primary and Secondary	0.148	0.356*
Internal market dynamics	–0.041	0.146*
* major absolute correlation between each variable and the discriminative functions		
Values of the canonical functions in the group centroids	*Function 1*	*Function 2*
Stage 1: factor driven (includes transition countries to phase 2)	–1.806	–.615
Stage 2: efficiency driven (includes transition countries to phase 3)	–.061	.768
Stage 3: innovation driven	1.382	–.537
Non standardized discriminative functions evaluated in the average of groups		

Classification results Predicted		*Factor driven*	*Efficiency driven*	*Innovation driven*	*Total*
Original	*Factor driven*	12 (92.3%)	1 (7.7%)	0 (0,0%)	13 (100%)
	Efficiency driven	2 (8.7%)	20 (87%)	1 (4.3%)	23 (100%)
	Innovation driven	1 (5.6%)	3 (16.7%)	14 (77.8%)	18 (100%)
Goodness of fit: they have been correctly classified the 85.2% of the countries in their original groups.					

5.2. Multivariable General Linear Model

To test the second hypothesis, data is composed by 52 nations that participated in the 2010 GEM NES survey and are also included in the 2010-2011 GCR. The EFCs are represented by quantitative continuous variables that include the average value of each nation on each condition and the overall GCI is represented by a quantitative continuous variable whose values have been extracted from the GCR. The generalized linear model expands the general linear model, so that the dependent variable is linearly related to the covariates by a particular link function. In addition, the model allows the dependent variable has a distribution that is not normal. Generalized linear model covers the most commonly used statistical models. In this case it was selected to analyze a wide set of dependent variables at the same time.

Table 5. Results of the multivariable general linear model of GCI on GEM EFCs

Dependent variable		*B*	*Sig.*	*R square*
Financial environment related with entrepreneurship	Intersection	1.012	0.003	0.275
	GCI	0,316	0.000	
Government concrete policies, priority and support	Intersection	1.062	0.019	0.184
	GCI	0.330	0.001	
Government policies bureaucracy, taxes	Intersection	0.749	0.091	0.214
	GCI	0.360	0.001	
Government programs for entrepreneurs	Intersection	0.442	0.247	0.385
	GCI	0.474	0.000	
Entrepreneurial level of education at Primary and Secondary	Intersection	1.672	0.000	0.019
	GCI	0.067	0.334	
Entrepreneurial level of education at Vocational, Professional, College and University	Intersection	2.875	0.000	0.00
	GCI	–0.008	0.918	
R&D level of transference	Intersection	0.490	0.064	0.508
	GCI	0.418	0.000	
Professional and commercial infrastructure access	Intersection	2.448	0.000	0.053
	GCI	0.115	0.101	
Internal market dynamics	Intersection	2.578	0.000	0.013
	GCI	0.091	0.417	
Internal market burdens	Intersection	1.851	0.000	0.090
	GCI	0.140	0.030	
Physical infrastructures and services access	Intersection	1.396	0.000	0.516
	GCI	0.511	0.000	
Cultural, social norms and society support	Intersection	1.963	0.000	0.052
	GCI	0.179	0.102	

5.3. Multiple linear regression analysis

To test the third hypothesis, data is composed by 52 nations that participated in the 2010 GEM NES survey and are also included in the 2010-2011 GCR. The EFCs are represented by quantitative continuous variables that include the average value of each nation on each condition and the overall is represented by a quantitative continuous variable whose values have been extracted from the GCR. The multiple linear regression models had been considered the simplest technique to make this approach.

Table 6. Multiple linear regression results of EFCs on the overall GCI

Dependent variable: overall GCI					
Independents	*B*	*Beta*	*Sig.*	*R square*	*Method*
Constant	2.072		0.000	0.705	Stepwise
Physical infrastructures and services access	0.626	0.445	0.000		
R&D transference	0.554	0.325	0.042		
Entrepreneurial level of education after the school	–0.758	–0.397	0.000		
Government programs	0.361	0.276	0.045		

5.4. Multiple linear regression analysis

To test the last hypothesis, data is composed by 52 nations that participated in the 2010 GEM NES survey and are also included in the 2010-2011 GCR. The EFCs are represented by quantitative continuous variables that include the average value of each nation on each condition and the GCI sub indexes (basic requirements, efficiency enhancers and innovation and sophistication factors), are represented by three quantitative continuous variables whose values have been extracted from the GCR. The multiple linear regression models had been considered the simplest technique

Table 7. Multiple linear regression results of EFCs on the GCI sub indexes that are critical at each stage of competitiveness

Stage 1: factor driven nations Dependent variable: Basic requirements sub index					
Independents	*B*	*Beta*	*Sig.*	*R square*	*Method*
Constant	0.205		0.805	0.705	Stepwise
Physical infrastructures and services access	1.116	0.840	0.001		
Stage 2: efficiency driven nations Dependent variable: Efficiency enhancers sub index					
Independents	*B*	*Beta*	*Sig.*	*R square*	*Method*
Constant	2.759		0.000	0.383	Stepwise
Financial access and availability for entrepreneurs	0.580	0.619	0.002		
Stage 3: innovation driven nations Dependent variable: Innovation and sophistication factors					
Independents	*B*	*Beta*	*Sig.*	*R square*	*Method*
Constant	2.282		0.023	0.335	Stepwise
Government concrete policies, priority and support	0.975	0.579	0.012		

to make this approach. Three analyses, one per competitiveness stages, have been applied.

6. Discussion

The first hypothesis states that the GEM NES information on the national entrepreneurial conditions is able to classify the GEM participating nations in their respective GCI stages of competitiveness, that is, in factor-driven, efficiency-driven and innovation-driven economies. If the data have this capacity this leads to the conclusion that the perceived stage of competitiveness depends on the EFCs state to some degree. We say the «perceived stage», because this is determined by the competitiveness sub-indexes, and they are calculated under the basis of a wide range of economic indicators, while the EFCs are the result of subjective evaluations made by experts. Thus, a nation can be perceived as out of its stage by the experts' opinion while the economic indicators state their real position.

The obtained results lead to completely accept this hypothesis: the discriminative analysis gave two canonical functions whose values allow positioning the GEM countries in the three stages at the 85.2% level, which is very high.

The partial results indicate that the EFCs values are more representative for the factor driven nations, because the model could place the 92.3% of the cases. The only exception, which represents a 7.7% of the total, was Jamaica, a nation considered in transition from the first stage to the second (see table 3). So, the global results for this group of countries are very satisfactory in terms of explanatory capacity of the canonical functions, and are so sensitive that could also capture the Jamaica's transition stage.

The next partial result is referred to efficiency driven nations. In this case, the 87% of countries were correctly assigned, while 8.7% (2 nations) and a 4.3% (1 nation) were assigned to factor driven and innovation driven stages respectively. The first two cases are: Peru and South Africa and the third case Uruguay. The valuation of the EFCs made by the experts in the two nations that have been identified as factor-driven could be indicating that some features of the entrepreneurial framework conditions are more near of those types of nations than the real competitiveness level. On the other hand, Uruguay is a transition country from the second to the third stage, which means that in this field, is possibly more aligned with innovation countries while its competitiveness level is still in transition.

Finally, with respect to the innovation driven nations, a 77.8% has been correctly classified, while a 16.7% (3 nations) has been identified as efficiency driven and a 5.6% (1 nation) as factor driven. The cases are: France, Finland and Slovenia predicted as efficiency driven and Italy predicted as factor driven. This result can be due to the crisis effect. The experts of these countries could have made so extreme negative valuations on critical EFCs that lead them to be matched to the situation of factor and efficiency driven nations. Further analysis on concrete EFCs must be done to make a formal explanation.

Thanks to this analysis, the explicative power of the NES information on the competitiveness stages is perceived as very high and able to offer interesting research lines and practical applications. In fact, due to the special characteristics of the year 2010, one can wonder if the EFCs of the innovation driven nations can be very differently perceived by experts, to the limit of matching them with situations that exceed the economic indicators conclusions. In this sense the «change» of position of Italy is very significant. This is interesting, as the NES has an important qualitative base and this arises when the information is related with the feeling of experts as part of the population and reflects what the people can say in crisis scenarios, despite the economic indicators. The conditions to start up could have become very worst in the Italy's case, and worst in the cases of France and Finland, although economically, the last country is well positioned compared with other European countries during the crisis.

The discriminative analysis also provides summarized information on the characteristics of the competitiveness stages thanks to the two canonical functions. The structure matrix reveals that the first canonical function is correlated with most of the entrepreneurial conditions, while the second is focused in entrepreneurial education provision (both at school and after school phases) and the internal market dynamics. Taking this in consideration and looking at the values of the functions in the averages of the groups (named «centroids» in the analysis results), it is possible to conclude that at factor driven stage, the core of the entrepreneurial conditions is evaluated by the experts as negative (the average value is –1.806), while the entrepreneurial education and the internal market dynamics is also perceived as negative but less than the core of conditions (the average value is –0.615). At the efficiency driven stage, the core of the entrepreneurial conditions is negative («centroid» has the value –0.061), but very near of the neutrality, that is, neither bad nor good, while the entrepreneurial education and the internal market dynamics are perceived as positive («centroid» has a value of 0.768 positive although not brilliant). Finally, at the innovation driven stage, the core of the entrepreneurial conditions is perceived as positive (the «centroid» value is 1.382), while the entrepreneurship education and the internal market dynamics is valued as some negative (the «centroid» value is –0.537).

This information explains that the core entrepreneurial conditions tend to improve as the competitiveness level so does, while the entrepreneurship education and the internal market dynamics improve from the factor driven situation to the efficiency driven stage, to strongly become worst when the innovation stage is achieved. This is consistent with the entrepreneurial activity analysis and the conclusions made by GEM researchers in several Reports: at the factor driven stage, there is a high level of necessity entrepreneurship that runs independently of the state of the core of framework conditions, as the population needs to survive anyway, but at least more supported by the entrepreneurial education —that can be interpreted, as a minimum, as basic skills to start up and develop an initiative— and by the internal market dynamics. At the efficiency driven stage, opportunity entrepreneurial activity increases, and this is thanks to the improvement of framework conditions, helped by the efficiency

enhancers, having a relevant role the entrepreneurship education, more extended because there are also intermediate levels of entrepreneurial activity and the population is more trained than those of innovation driven nations. As the entrepreneurial activity is of more quality than in the factor driven nations, this also is consistent with a more qualified entrepreneurial skills and knowledge. Finally, at the innovation driven stage, the entrepreneurial activity rates are, in average, lower compared to the previous stages. Thus, the population loses entrepreneurial spirit and consequently, skills and knowledge, situation that is perceived by the experts and showed in their evaluations. In these nations, the «natural» entrepreneurial training of the population is reduced and affects to a little part of the populations, while the internal market tends to favor the big companies, the public sector and less the entrepreneurial initiatives. The core of the framework conditions can be positive, but there is a lack of entrepreneurial capacity. The governments tend to implement actions to foster entrepreneurship, including entrepreneurship education at the schools, universities, business schools and other institutions, but the impact of these actions is still perceived as very reduced and several years must pass before this effect can be detected.

The second hypothesis stated that the overall GCI has limited capacity to explain the entrepreneurial conditions. This hypothesis can also be interpreted as a way to say that the NES information cannot be completely substituted by the GCI to provide a diagnostic on the entrepreneurial framework conditions. The results of this analysis lead to accept the statement: the GCI has some capacity to explain most of the EFCs, but both sources are not correlated to the point of being indicated to substitute one by the other. The GCI is more general and the NES provides specific information on the conditions for entrepreneurs.

The general regression model stated that the GCI can explain part of all the entrepreneurial conditions except those referred to: entrepreneurship education and training at the school and after school stages; the commercial and professional infrastructure for entrepreneurs; the internal market dynamics and the social and cultural norms.

The highest explanatory capacity is on the physical and services infrastructure for entrepreneurship, followed by R&D transfer level. The explanatory capacity is also significant but more reduced for: government programs, financing for entrepreneurs and government policies.

On the contrary, the NES has high capacity to explain the GCI. This can be stated thanks to the results obtained in the multiple regression analysis of the EFCs data on the GCI. The NES data can explain the 70.5% of the GCI. But, of the set of conditions, the stepwise procedure only accepted four as explanatory: the physical infrastructures and services access, the R&D transfer, the entrepreneurship education after the school and the government programs for entrepreneurs. The regression coefficients are: positive and very significant for physical infrastructure and services access for entrepreneurs, less significant but also positive for the R&D transfer and the government programs, and negative and very significant for the entrepreneurship education after the school.

This result indicates that thanks to the information on few EFCs it can be predicted quite consistently the competitiveness stage of a country, being these EFCs critical to experience gains and loss in the GCI. Thus, if the access to physical infrastructures and services for entrepreneurs improves, the country gains in competitiveness, and the same can be said about the R&D transfer for entrepreneurs and the governmental programs: as they increase, so can do the competitiveness index. The average gain can be of 0.626 points of the GCI for the physical infrastructures, 0.554 points for the R&D transfer and 0.361 for governmental programs. On the contrary, if the entrepreneurship education after school was incremented, the GCI can suffer an average loss of 0.758 points. This result, although seems contradictory to foster entrepreneurship, is logical from the point of view of competitiveness, as the nations that lead the GCI are those that have the minor entrepreneurial activity rates, while the nations with lower GCI values are those that have the major entrepreneurial activity rates. The entrepreneurship education must be an instrument to achieve high quality entrepreneurial activity that increases the GCI and this contribution must be detectable by this index to turn this negative effect in positive in the long term. In the present situation, the entrepreneurship education is perceived as in a negative state by experts worldwide (Coduras, Kelley, Levie, Saedmundsson and Schott, 2009), and this limits its power to contribute to foster entrepreneurial activity and have a significant impact in competitiveness. If the experts' evaluation could change its sign, thanks to actions to implement a qualified educational system worldwide, the results of this analysis could also change.

Finally, about the fourth hypothesis, the results indicate that it can be partially accepted. Thus, the NES information, showed high capacity to explain the basic requirements sub index (70.5%), while showed less capacity (as expected), to explain the efficiency enhancers sub index (38.3%) and the innovation and sophistication factors sub index (33.5%)

For the first sub index, critical to explain the factor driven nation's competitiveness, only one EFC entered in the model: the physical infrastructures and services access. The result indicates that if this condition improved, so could happen with the sub index in an average of 1.116 points. It is interesting to state that the most basic EFC is the one that explains this also basic sub index. The result is consistent with the competitiveness report literature.

For the second sub index, it also entered only one EFC as explanatory: the financial access and availability for entrepreneurs. Thus, in this case, if this condition improved, so will do the efficiency enhancers, in an average of 0.580 points, although the goodness of fit is fewer than in the previous case (38.3%), and consequently the predictive capacity is less confident. What is of most interest is to see what EFC is most critical for efficiency driven nations to improve their key sub index, and to state that there is a difference among the three stages of competitiveness.

Finally, in the innovation driven nations case, the only EFC that has explanatory capacity on the Innovation and sophistication factors sub index is the state of government concrete policies, that is, those focused in the consideration of the entrepreneur-

ship as a priority of the government and the governmental support to entrepreneurship. If this condition could improve, the average gain for this competitiveness sub index would be of 0.975 points. Again, this result must be considered tentative as the goodness of fit of the model is low (33.5%) and its predictive capacity is not highly confident.

7. Conclusions, limitations, prospective of new research lines and recommendations

The first conclusion that can be extracted of this research is that the GEM NES data provide differential and complementary information that cannot be substituted by the Global Competitiveness Index and sub-indexes. This justifies the continuity of this original source of information, being the first recommendation, to make a methodological review to promote its validation and put in more value its capacities as a qualitative complement to analyze the entrepreneurial context. GEM and integrated indexes must profit its potential and analysis capacity for more purposes beyond the description of the entrepreneurial framework conditions and their annual diagnoses. Thus, for example, for the present economic crisis, experts' provide qualitative details that are important for the entrepreneurial context as several countries can accuse relevant changes in the conditions to start up. The worsening could be equivalent to lose several positions in the global competitiveness index to the point that experts could perceive the situation of some entrepreneurial conditions as if the country was in a lower group of competitiveness. Also, the contrary situation can occur, and in some countries experts can be anticipating competitiveness transitions to upper stages. The NES data have demonstrated high capacity to classify nations in their respective competitiveness stages, and the source has shown its extremely sensitivity capturing transition economies and special conflictive situations due to the crisis in a year in which the information can especially be disturbed by the particular global economic climate. This helps to reinforce two aspects of these data: the future validation of the methodological design by one side and the quality of the data by the other.

The limitation of the analysis is related with two issues: the incomplete series of data, and that the results and conclusions can vary each year. GEM is a growing project, and nowadays in still far from the GCI sample: 59 participating in front of 139. But the GEM has had also an additional problem: not all the participating nations completed in the last years the national expert's survey. Thus, for example, the year 2010, 59 nations have participated in the monitor, but 5 of them did not the NES. This problem is being solved, as national teams improve their knowledge and understanding of the usefulness of this original source of information.

Since the review of the GEM theoretical model, another problem could come over the NES: if the GCI provides an overall index and three sub-indexes that seem to provide similar information: is it really necessary to make the NES? The research line presented in this paper includes arguments to give a negative response: the NES is providing complementary information that is not uncovered by the GCI. Thus, the

second recommendation is to review again the GEM theoretical model differentiating the impact of the competitiveness in the TEA —that has been demonstrated that exists— (Bosma, Acs, Autio, Levie, 2008) and to make more clear the role and place of the NES information in the model.

The present research led to other important results: the NES data can be partly explained by the GCI and the NES data also can explain part of the GCI and the subindexes of each development stage. This leads to other interesting conclusions: the competitiveness index is able to explain the state of the entrepreneurial conditions and it could be interesting to make analysis each year to follow the evolution of this explanation in general and at each stage of competitiveness to see the improvement or loss they experience due to the influence of the pillars of the economy. The GEDI index (Acs, Szerb, 2009, 2010) is progressing in this line, but does not include the NES information to elaborate its conclusions.

On the other hand, the inverse analysis leads to conclude that the EFCs can explain the overall GCI, being this perspective more informative as it allows determining what entrepreneurial conditions are critical to improve the GCI. The third recommendation is to make this analysis each year and to follow the evolution of the EFCs that enter the model. As GEM is committed with the entrepreneurship development, the project could contribute to assess the GCI from the perspective of the entrepreneurship contribution to the national competitiveness, and the NES can provide information about the key conditions that must be reinforced each year to improve the GCI.

The contribution of this research is to improve the knowledge and diffusion of the GEM NES data, and especially, to open new research lines that can be of scientific interest and practical application. The future goals in this field are: to compare part of the NES information with the EDB and EFI data; to reconsider the NES place in the GEM revised theoretical model; to build practical analysis tools to implement the main findings of this research; to study how is their evolution in the next years; to investigate more in deep the relationships between the EFCs and concrete pillars of the economy using the information collected by the GCR, and finally, to try to contribute to the interaction between these two powerful sources of data, submitting the entrepreneurial framework conditions analysis to the GCI analysts for their consideration.

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Section ARTICLES

Investigaciones Regionales

Institutional and economic determinants of the perception of opportunities and entrepreneurial intention

Antoni Vidal-Suñé *, María-Belén López-Panisello *

ABSTRACT: This paper aims to identify the institutional and economic factors that influence the perception of business opportunities, and the latter's influence on entrepreneurial intention. We use an institutional approach for the Spanish Autonomous Regions for the period 2004-2010, based on the data available in the regional GEM reports, supplemented by data from the INE (Instituto Nacional de Estadística - Spanish National Institute of Statistics). By applying a structural equation model, we observed that the perception of abilities (self-efficacy) positively and significantly affects both the perception of opportunities and entrepreneurial intention, and that the perception of opportunities affects entrepreneurial intention.

JEL Classification: L26.

Keywords: entrepreneurship; business creation.

Determinantes institucionales y económicos de la percepción de oportunidades y de la intención emprendedora

RESUMEN: El presente trabajo pretende identificar los factores institucionales y económicos que inciden en la percepción de oportunidades de negocio, así como de ésta en la intención emprendedora. Se utiliza un enfoque institucional a nivel de las Comunidades Autónomas españolas en el periodo 2004-2010, en base a los datos disponibles en los informes GEM a nivel regional, complementados con datos obtenidos del INE. Aplicando un modelo de ecuaciones estructurales, se observa que la percepción de capacidades (autoeficacia) incide positiva y significativamente tanto sobre la percepción de oportunidades como sobre la intención empren-

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dedora, así como que la percepción de oportunidades incide sobre la intención emprendedora.

Clasificación JEL: L26.

Palabras clave: emprendimiento; creación de empresas.

1. Introduction

In order for new business initiatives to emerge, there must be certain factors that have a positive effect on entrepreneurial activity, *i. e.* which are conducive to the creation of new businesses. There have been three main approaches in the research undertaken in this area in recent decades (Álvarez and Urbano, 2012): 1) the *economic approach*, which argues that the creation of new businesses is due to purely economic factors (Audretsch and Thurik, 2001; Audretsch and Keilbach, 2004, Parker, 2004; Wennekers *et al.*, 2005); 2) the *psychological approach*, which only considers the individual psychological traits of individuals as determinants in the emergence of entrepreneurs (Carsrud and Johnson, 1989; Stewart *et al.*, 1999; Baron, 2000), and 3) the *sociological or institutional* approach, according to which sociocultural factors in the environment determine individuals' decisions to become entrepreneurs (Shapero and Sokol 1982; Aldrich and Zimmer, 1986; Berger, 1991; Veciana, 1999; Busenitz *et al.*, 2000; Steyaert and Katz, 2004; Manolova *et al.*, 2008; Gómez-Haro and Salmerón-Gómez, 2011).

This paper analyzes the impact on the perception of business opportunities of various factors in the economic and institutional context, and the impact of this perception and the perception of abilities (self-efficacy) on entrepreneurial intention, based on the data available in the GEM reports, for the Spanish Autonomous regions (excluding the autonomous cities of Ceuta and Melilla) in the period 2004-2010, supplemented with data from the National Statistics Institute (INE). We thereby aim to obtain a better understanding of the economic and institutional aspects that influence entrepreneurial intention among the Spanish population at a regional level. The results obtained in the research, which are of a markedly exploratory and predictive nature, contribute to progress in the analysis of the environmental factors that shape perceptions of business opportunities, perceptions of individuals' own abilities for entrepreneurship, and the factors in these perceptions shaping intentions to create new businesses.

2. Economic and institutional factors determining entrepreneurial intention

The act of creating a business entails planned behaviour that can be predicted based on the intentions presented by the individual at a given time (Krueger *et al.*, 2000). Entrepreneurial intention can be defined as «the state of mind that directs at-

tention, expertise and action towards a business concept» (Bird, 1988: 442); *i. e.* it explains individuals' thoughts and actions as regards their willingness or intention to create a new business. The study by Carayannis *et al.* (2003) observed that macroeconomic, sociocultural and politico-legal environmental factors (including the presence or absence of active institutional policies for business creation) have a major impact on entrepreneurial intention.

Of the three approaches (psychological, economic, institutional), in this paper we mainly use the institutional approach (North, 1990) applied to an analysis of the factors affecting entrepreneurial intention (Thornton *et al.*, 2011; Urbano, 2006; Veciana and Urbano, 2008, among others). However, some economic variables are also considered, like those included in the GEM model (Hernández Mogollón, 2012). Many studies show that the institutional approach is the most useful for analyzing the phenomenon of entrepreneurship (Gnyawali and Fogel, 1994; Vaillant and Lafuente, 2007, among others). Within this institutional framework, Gnyawali and Fogel (1994) consider five dimensions that determine entrepreneurial activity: *a)* government policies and procedures (the actions by which governments seek to influence the mechanisms and regulation of the market so that it operates efficiently); *b)* social conditions (favourable attitudes towards entrepreneurship and the existence of successful models of reference) and economic conditions (aspects such as economic growth, diversity of economic activity, unemployment rate, inflation rate, etc.); *c)* entrepreneurial knowledge and skills (the technical skills necessary to start a new business, acquired through business management training); *d)* financial assistance for entrepreneurship (financing facilities for starting the new business), and *e)* non-financial assistance (advice on conducting market research, preparation of the business plan, access to contacts and social networks). Shane and Venkataraman (2000) corroborate this approach by developing a model based on business opportunities, which considers the need to introduce the economic and institutional characteristics of markets into the conceptual framework.

One of the factors that is most heavily emphasized by the institutional approach as a determinant factor in the development of entrepreneurial intention is individuals' *confidence in their own knowledge and entrepreneurial skills*. Self-confidence is defined as an individual's belief in their personal ability to organize and execute a project or a specific set of tasks that are necessary to achieve certain goals or intended outcomes, which in this case is the creation of a business. Self-confidence or the perception of one's own abilities for entrepreneurship has been theoretically and empirically related to the phenomenon of the entrepreneurial process, as a factor that encourages individuals to be entrepreneurial (Boyd and Vozikis, 1994; Krueger and Brazeal, 1994; Chen *et al.*, 1998; Burke *et al*., 2002; Arenius and Minniti, 2005; McGee *et al.,* 2009). Some authors claim that an individual makes the decision to become an entrepreneur depending on their assessment of their skills (Arenius and Minniti, 2005). Individuals who have the most confidence in their own abilities have the most entrepreneurial intentions, while people lacking confidence in their abilities do not create businesses (Krueger and Brazeal, 1994; Arenius and Minniti, 2005; Wilson *et al.,* 2007). Accordingly, we propose the following hypothesis:

H1: *Individuals' perception of skills or confidence in their own knowledge and entrepreneurial abilities (self-efficacy) positively affects individuals' entrepreneurial intention*.

An important line of research in the field of entrepreneurship focuses on the connection between entrepreneurs and their *perception of their skills* for enterprise, and the identification of valuable business opportunities (Eckhardt and Shane, 2003; Shane and Venkataraman, 2000; Venkataraman, 1997). The identification and selection of suitable opportunities for creating new businesses is therefore the most important skill an entrepreneur can possess in terms of being able to succeed. An individual can only start a new business initiative if they recognise that there is a business opportunity capable of generating profits, and for this to be possible, the individual must have the cognitive properties that enable this assessment to be made (Shane and Venkataraman, 2000). Some research studies have shown that certain characteristics of individuals are related to the successful identification of opportunities (Ardichvili *et al.*, 2003); these characteristics include their level of optimism, understood as confidence in their self-efficacy for entrepreneurship, which leads the individual to see opportunities rather than threats in a given situation (Shane and Venkataraman, 2000). In other words, self-efficacy (confidence in the perception of the individual's own abilities) is considered a determinant factor in the ability to identify and evaluate business opportunities. This leads us to our next hypothesis:

H2: *The individual's perception of skills or self-confidence in their own knowledge and entrepreneurial skills (self-efficacy) positively affects the perception of business opportunities*.

Furthermore, the *perception of business opportunities* is directly related to entrepreneurial intention. One of the conclusions of the study by Arenius and Minniti (2005) is that the perceived ability to identify business opportunities is directly and positively correlated with the desire or intention to start a new business project. According to Roure *et al.* (2007), the identification of suitable business opportunities is an important and essential skill that the aspiring entrepreneur must possess, without which the intention to create a business is unlikely to emerge. In their study, Koellinger *et al.* (2007) identify the perception of business opportunities as the decisive event in entrepreneurial intention. Davidsson and Honig (2003) state that higher quality human capital is better at identifying business opportunities and successfully exploiting them. However, individuals' judgment of their ability to identify business opportunities has also been identified as one of the main cognitive factors affecting the entrepreneurial spirit or intentions (Baughn *et al.,* 2006). This means that if an individual feels that he/she possesses these skills, he/she may consider starting a new business initiative (Krueger *et al.*, 2000). This is the evidence based on which we set out the following hypothesis:

H3: *The perception of business opportunities has a positive effect on individuals' entrepreneurial intention*.

One of the most critical factors affecting the entrepreneurial process is the *ease of access to financial resources*. According to Levie and Autio (2008), financing is

recognized as the most important regulator of the allocation of efforts in entrepreneurial initiatives. Meanwhile, Leibenstein (1968) noted that the sophistication of credit systems encourages financing for entrepreneurial projects. Financing difficulties encountered by entrepreneurs are therefore regularly cited as a barrier to the creation of new businesses (Volery *et al.*, 1997; Kouriloff, 2000; Robertson *et al.*, 2003; Choo and Wong, 2006); as the lack of initial capital, the high cost of private financing, and the obvious difficulty with finding external resources, generally forces entrepreneurs to resort to public funding, through grants and/or low interest loans (Urbano, 2006). In short, the ease of access to sources of financing should be considered as a structural factor that influences entrepreneurial intention, which leads us to propose the following hypothesis:

H4: *Ease of access to sources of financing positively affects entrepreneurial intention*.

The institutional literature on entrepreneurship places particular emphasis on the role of the government as a key factor affecting the perception of opportunities, which can be broken down into three major aspects. First, the *government policies* that affect the entrepreneurial process, which is the interest shown by government bodies in entrepreneurship; or, like those defined by Lundström and Stevenson (2001:18) as «governments should focus their effort on creating a culture that validates and promotes entrepreneurship throughout society and develops a capacity within the population to recognize and pursue opportunity». Levie and Autio (2008) argue that government policy is a key determinant factor in the perception of the entrepreneurial opportunity. In fact, there is a general consensus that entrepreneurship is a phenomenon that can be addressed by policymakers, and that increased awareness and attention from policymakers should be positively associated with the allocation of efforts towards entrepreneurship (Audretsch *et al.*, 2007). This opinion was shared by Leibenstein (1968), who recommended that government policy should focus on improving market efficiency and providing an environment that responded to motivated entrepreneurs. It is thus suggested that the government should concern itself with entrepreneurs when designing and implementing policies (Levie and Autio, 2008). This allows us to set out the following hypothesis:

H5: *Government policy has a positive effect on the perception of business opportunities*.

Second, *regulation and legislation* related to entrepreneurship is considered part of the government's work. Kirzner (1985) showed that entry and exit barriers inhibit the entrepreneurial process. Government regulation, seen in terms of the bureaucratic aspects related to procedures for the creation of businesses, is commonly cited as a strong entry barrier that discourages the perception of opportunities and the entrepreneurial process (Van Stel *et al.*, 2007; Grilo and Irigoyen, 2006; Klapper *et al.*, 2006). This means that excessive regulation, high taxes and labour market rigidities tend to combine as major obstacles to business creation (Choo and Wong, 2006; Klapper *et al.*, 2006). For Verheul *et al.* (2001), one of the main policies that the government can promote, based on the demand for entrepreneurial activity, is one designed to

increase or promote the development of new business opportunities for potential entrepreneurs by the deregulation of certain specific sectors. Based on the above, we set out the following hypothesis:

H6: *Government regulation has a negative effect on the perception of business opportunities*.

The third aspect related to government action is *programmes fostering entrepreneurship*. Leibenstein (1968) recognized the crucial importance of fostering the entrepreneurial spirit; this could be undertaken by the government by implementing mentoring programmes and promoting professional services for entrepreneurs (Fischer and Reuber, 2003; Clarysse and Bruneel, 2007). Governments can facilitate the identification of business opportunities and the entrepreneurial process by offsetting entrepreneurs' shortcomings in their resources and abilities, through programmes of subsidies and financial aid, training programmes, providing information and advice, etc. (Dahles, 2005; Keuschnigg and Nielsen, 2004; Lorenzo *et al.*, 2008). These programmes reduce transaction costs in business creation (Shane, 2002) and improve the human capital of potential entrepreneurs (Fayolle, 2000; Delmar and Shane, 2003). This means that entrepreneurs can identify new valuable business opportunities more easily, because there is a strong tendency by public bodies to design measures to encourage entrepreneurship, improve the entrepreneurial climate and create a more innovative and creative society that takes advantage of opportunities in the market (Gómez-Haro and Salmerón-Gómez, 2011). In other words, public incentives are a factor considered by the entrepreneur at the start of any activity, especially in order to detect an opportunity in the market or to have an innovative business vision (Belso, 2004). Based on the above, we set out the following hypothesis:

H7: *Government programmes promoting entrepreneurship have a positive effect on the perception of business opportunities*.

Another key factor is *entrepreneurship education and training*. This is the process in which individuals acquire knowledge, skills, attitudes and values related to the creation and consolidation of businesses. As pointed out by Gómez *et al.* (2007), in Spain, training in aspects of business management and business creation at the various levels of education has to date been rather limited, which may negatively affect the rate of entrepreneurial activity. Indeed, as noted by Levie and Autio (2008), education and training in entrepreneurship is one of the most widely used means of encouraging entrepreneurial activity, because they are positively associated with expectations for growth of new businesses as a result of the improvement in the level of perception of business opportunities. As a result, specific training in entrepreneurship: *a)* improves the provision of individuals' instrumental skills for starting a new business (Honig, 2004; Wilson *et al.,* 2007), and *b)* improves individuals' cognitive ability to identify and assess business opportunities (Detienne and Chandler, 2004). Acs *et al.* (2009) state that the knowledge possessed by entrepreneurs, and especially the knowledge that they are able to generate, enables them to identify new business opportunities, and this depends on the training the individual concerned has received. This leads us to the following hypothesis:

H8: *More education and training in entrepreneurship positively affects the perception of business opportunities*.

Market dynamics refers to the level of changes taking place in the market targeted by the new company, *i. e.* the set of structural characteristics in the sectorial environment in which competition between businesses takes place. Thus, if the new activity is aimed at sector in which a great deal of changes are taking place, this may be the opportunity to find a niche or a good business opportunity, which will promote the creation of businesses; furthermore, the fewer the barriers to entry and exit, the greater the opportunities for finding a niche in which to develop a new business (Levie and Autio, 2008). According to Rumelt (1987), changes in the competitive environment create business opportunities, *i. e.* the more dynamic the market the entrepreneur is seeking to enter, the greater their perception of opportunities. The hypothesis related to this aspect is that:

H9: *A higher level of market dynamics positively affects the perception of business opportunities*.

Turning to economic factors, we first need to examine the *GDP per capita*. An increase in per capita income leads to higher levels of entrepreneurship, as the population's higher income level affects demand and therefore business opportunities. The research by Wennekers *et al.* (2002) considers per capita income as an economic predictor for start-up businesses, and Uhlaner and Thurik (2007) found that per capita income is a determinant for entrepreneurial activity. Levie and Autio (2008) included GDP per capita in their study as a determinant factor in the perception of business opportunities. Consequently, this gives us:

H10: *A higher GDP per capita positively affects the perception of business opportunities*.

The *regional unemployment rate* may influence the perception of business opportunities, due to the fact that the increase in unemployment leads to an increase in entrepreneurship out of necessity; although a high level of unemployment may also be linked to a situation of economic depression that makes the idea of creating a new company unattractive (Uhlaner and Thurik, 2007). According to Audrestch (2002), there is a negative relationship between unemployment and entrepreneurial activity; this is because at times of economic recession, with a drastic reduction in demand, there is a reduction in the perception of business opportunities. However, a long-term unemployment changes transforms this relationship from negative to positive by making self-employment a necessity (Evans and Leighton, 1990). There is therefore no agreement in the literature on the sign of the relationship between the unemployment rate and the perception of opportunities. We believe that this relationship must be negative, since although a higher unemployment rate may lead to an increased perception of business opportunities among entrepreneurs due to necessity, we believe that the negative effect of a decline in demand will prevail, leading to a reduced perception of business opportunities. It is therefore possible to set out the following hypothesis:

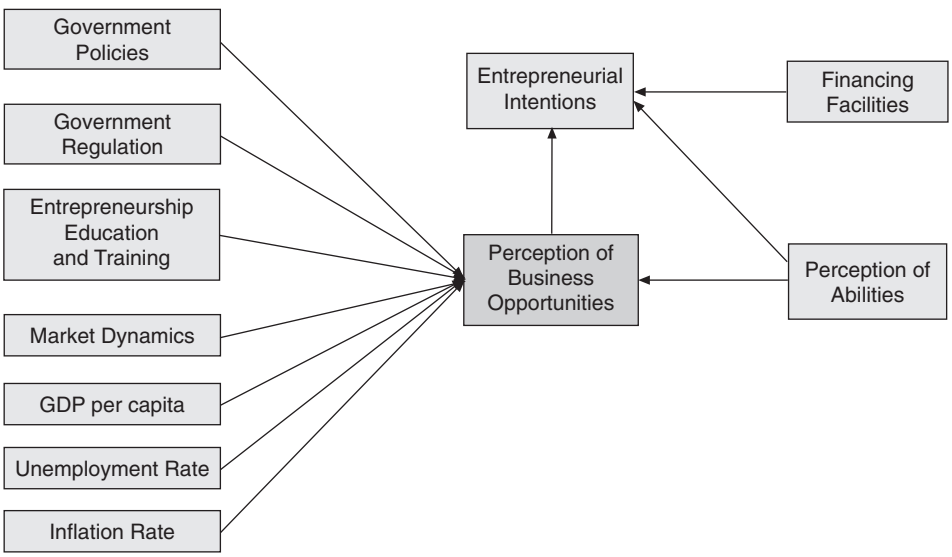
H11: *A higher unemployment rate negatively affects the perception of business opportunities*.

Another interesting economic factor is the *inflation rate*. According to Shapero (1978) and Gibb and Ritchie (1982), a rise in inflation leads to higher levels of entrepreneurship, because of its impact on business opportunities for various products or services based on their relative prices. However, according to Georgiou (2009), inflation increases businesses' wage costs and erodes the purchasing power of consumers, which reduces the perception of valuable business opportunities among entrepreneurs. In other words, inflation increases the population's income inequality and reduces the reward entrepreneurship, becoming an obstacle to entrepreneurship (Perotti and Volpin, 2004). For Singh and DeNoble (2003), high inflation reduces access to capital due to higher borrowing costs; and as such inflation reduces the likelihood of entrepreneurship. There is therefore no clear position regarding the impact of inflation on the perception of business opportunities, but we tend to think that its effect must be positive, which is why we set out the following hypothesis:

H12: *A higher inflation rate positively affects the perception of business opportunities*.

Figure 1 shows the model to be analyzed, specifying the relationships between the different variables considered which underpin the hypotheses formulated.

Figure 1. Analysis model



3. Methodology

3.1. Data sources

The data for the empirical study have been obtained from two sources. First, we obtained the main indicators for entrepreneurship from the reports available from the GEM study of 17 Spanish autonomous regions (except the autonomous cities of Ceuta and Melilla) for the period 2004-2010, for both the results of the adult population survey (APS) and the consultation of the panel of experts (NES). These are complemented to the economic factors considered using the data from the INE (Instituto Nacional de Estadística - Spanish National Institute of Statistics). The variables obtained as mean values at a regional and annual level from the adult population survey (APS) in the GEM study, measured as a percentage of total population, are: FUTSUP (Entrepreneurial Intention), OPPORT (Perceived Business Opportunities), SUSKIL (Perception Capacity). The variables obtained as mean values of the experts' opinion (NES) consulted at a regional and annual in the GEM study, measured on a 5-point Likert scale, are: ki_a_sum (Financing Facilities), ki_b_su1 (Government Policies), ki_b_su2 (Government Regulation), ki_c_sum (Government Programmes), ki_d_su2 (Entrepreneurship Education and Training), ki_g_su1 (Market Dynamics). Finally, the INE provided data for the variables for each autonomous region and year: GDP per capita, Unemployment Rate and Inflation Rate.

Because the GEM reports did not report on the level of Spanish autonomous regions with any regularity until 2004 [1], we chose this year as the starting point for data collection. However, because the various autonomous regions were gradually included in the GEM, data are not available for all of them in the early years of the period analyzed. As such, there were only 103 observations available for our empirical study, when the total population would be 119. As a result, working at a confidence level of 95%, and assuming the hypothesis of maximum uncertainty, the sampling error ranges between ± 0.025 and ± 0.06, depending on whether or not the population size is known. Table 1 presents the mean values, standard deviation and correlation coefficients between the variables considered in the study carried out.

3.2. Method of estimation

Structural equation models allow the statistical relationship between variables to be analyzed, considering the simultaneity of regression equations, where the same variable can take the role of an independent variable in some regressions and a dependent variable in others. In structural equation models, the approach based on variances or *Partial Least Squares* (PLS) is a technique that has been the subject of

[1] For a discussion of the evolution of the GEM project in Spain and how its network of regional teams operates, see De la Vega *et al.* (2007).

Table 1. Mean, standard deviation and correlations between variables

Variable	*Mean*	*Standard Deviation*	*Correlation*											
			1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
1. Entrepreneurial Intention	6.13	1.95	1											
2. Perception of Business Opportunities	25.77	8.94	0.281**	1										
3. Perception of Entrepreneurial Skills	46.69	6.74	0.282**	0.247*	1									
4. Facilities Access Financing	2.49	0.39	0.122	0.316**	–0.031	1								
5. Government Policy	2.75	0.33	0.130	0.286**	–0.041	0.542**	1							
6. Government Regulation	2.71	0.35	0.190	0.405**	0.104	0.589**	0.336**	1						
7. Government Programmes	3.08	0.34	0.027	0.219*	0.022	0.570**	0.658**	0.638**	1					
8. Entrepreneurship Education and Training	2.72	0.23	0.215*	0.172	0.069	–0.022	0.185	0.380**	0.335**	1				
9. Market Dynamics	2.29	0.28	0.037	–0.403**	–0.059	–0.088	0.012	–0.038	0.030	–0.028	1			
10. Regional GDP per capita	22,242.99	4,480.13	0.045	–0.151	0.048	0.242*	–0.087	0.141	0.150	–0.184	–0.076	1		
11. Regional Unemployment Rate	11.94	5.56	–0.069	–0.446**	0.018	–0.560**	–0.197*	–0.469**	–0.375**	–0.086	0.402**	–0.458**	1	
12. Regional Inflation Rate	2.35	1.92	0.228*	0.455**	0.042	0.345**	0.133	0.333**	0.143	0.066	–0.052	0.069	–0.428**	1

* $p < 0.05$
** $p < 0.01$

increasing interest and use among researchers in recent years (Fornell, 1982; Barclays *et al.*, 1995; Hulland, 1999; Haenlein and Kaplan, 2004). Unlike covariance-based models (CBM), PLS estimates do not imply a statistical model and therefore avoid the need to make assumptions about the distribution of the variables (Fornell and Bookstein, 1982). Moreover, according to Johansson and Yip (1994), as each structural sequence in the causal subsystem is estimated separately, very small sample sizes can be accepted. As stated by Barroso *et al.* (2007), following Chin *et al.* (2003) the objective of PLS modeling is to predict dependent variables, which is why PLS is better suited to predictive applications and theory development (exploratory analysis), although it can also be used to confirm the theory (confirmatory analysis). Structural equation models have also been widely used in the social and behavioural sciences in recent decades, including the application of the PLS technique in the study of entrepreneurship. These include some recent research, including the studies by Lanero (2011), who analyzes an explanatory model of entrepreneurial intention among university students; the study by Etchebarne *et al.* (2010), who analyze the relationship between companies' entrepreneurial orientation and their export performance, and the study by Zapico *et al.* (2008) which examines the effect of motivation due to entrepreneurs' self-employment on entrepreneurial intention.

Because the number of observations in our study is relatively small, with variables with an unknown distribution (an absence of normality), and because the study was carried out on a distinctly exploratory and predictive basis, we used the PLS technique because we believed that it is best suited to the characteristics of the data and the research approach. The program SmartPLS 2.0 (Ringle *et al.*, 2005) was used for the estimates.

4. Results

The PLS estimation of the structural model is shown in table 2. The significance of the estimated structural coefficients was performed using a *bootstrap* approach (Chin, 1998) with 900 subsamples from the original sample size. The explanatory power of the model is evaluated through the explained variance (value of R^2) of the dependent variables, where the model accounts for 13.1% of the variance in entrepreneurial intention and 57.7% of the perception of business opportunities; these are both higher than the minimum required level of 10% suggested by Falk and Miller (1992). Following Chin and Newsted (1999), this approach was complemented by the Stone-Geisser test for predictive relevance (Stone, 1974; Geisser, 1975), which presented a positive Q^2 statistic for all dependent variables, showing evidence of predictive relevance.

As for the relationship between perceived skills and entrepreneurial intention (H1), the estimated parameter is clearly significant ($\beta = 0.23$; $p < 0.01$), and as such this hypothesis is acceptable. The relationship between perceived skills and perceived business opportunities (H2) also presents a significant parameter, albeit at a lower

Table 2. Hypothesis confirmation

Hypothesis	*Standardized b*	*t–statistic (Bootstrap) g. l. = 102*
H1. Perception of skills → Entrepreneurial intention	0.2339 ***	3.0031
H2. Perception of skills → Perception of Opportunities	0.2308 *	1.8975
H3. Perception of opportunities → Entrepreneurial intention	0.2032 **	2.2349
H4. Financing facilities → Entrepreneurial intention	0.0651	0.6715
H5. Government policies → Perception of Opportunities	0.2032 ***	2.7148
H6. Government regulation → Perception of Opportunities	0.2366 ***	2.7165
H7. Government programmes → Perception of Opportunities	–0.1481	1.3907
H8. Entrepreneurship training → Perception of Opportunities	–0.032	0.5315
H9. Market dynamics → Perception of Opportunities	–0.2741 ***	4.0188
H10. GDP per capita → Perception of Opportunities	–0.3336 ***	4.4439
H11. Unemployment rate → Perception of Opportunities	–0.2945 ***	3.0226
H12. Inflation rate → Perception of Opportunities	0.2453 ***	2.8843

R^2 (Entrepreneurial intention) = 0.131; R^2 (Perception of Opportunities) = 0.577.
* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

confidence level ($\beta = 0.23$; $p < .10$), Meanwhile, the parameter between the perception of opportunities and entrepreneurial intention (H3) is also significant ($\beta = 0.20$; $p < 0.05$), meaning that this hypothesis can be accepted. However, in the relationship between financing facilities and entrepreneurial intention (H4), there is no evidence of a significant relationship between them ($p > 0.10$), meaning that this hypothesis cannot be accepted.

As regards the impact of institutional and economic factors on the perception of business opportunities, the estimated model shows that they can be considered as determinant factors, since they present the following significant parameters: H5, government policies ($\beta = 0.20$; $p < 0.01$); H6, government regulation ($\beta = 0.23$; $p < 0.01$); H9, the market dynamics ($\beta = –0.27$; $p < 0.01$); H10, regional GDP per capita ($\beta = –0.33$; $p < 0.01$); H11, the regional unemployment rate ($\beta = –0.29$; $p < 0.01$), and H12, the regional inflation rate ($\beta = 0.24$; $p < 0.01$); However, only hypotheses H5, H11 and H12 can be accepted, since in addition to presenting a significant parameter, they do so with the expected sign. By contrast, despite having significant parameters, H6, H9 and H10 must be rejected because they present the opposite sign to the one expected. Furthermore, the relationships between the perception of opportunities and government programmes to promote entrepreneurship (H7) and entrepreneurship education and training (H8) present parameters that are not statistically significant ($p > 0.10$), which means that both hypotheses must be rejected.

5. Discussion and conclusions

This study attempts to analyze, on a markedly exploratory and predictive basis, the impact of a number of institutional and economic variables on the perception of business opportunities, and the impact of this perception and the perception of entrepreneurial skills (self-efficacy) on entrepreneurial intention.

First, we must refer to the limitations of the study carried out. It is possible to make a clear distinction between two stages in the economic cycle during the period analyzed (2004-2010) —one of expansion until mid— 2007, and another of recession from that point onwards. This may distort the estimate obtained, because the data from the expansion phase are offset by those from the recession phase. Consequently, it would be useful to perform the analysis while distinguishing between the two periods. This would require more observations for each sub-period, which is currently not feasible due to the fact that the data used from the regional reports for the GEM project are available only for the years in question; and an analysis of a panel data model cannot be performed, since there are only 17 data (one for each autonomous region) for each year, which is an insufficient number of observations for the statistical requirements of such an approach.

Furthermore, the results obtained are not directly generalizable, as it is a study of specific regions, in Spain, with their own characteristics in a specific time period; similar studies should therefore be carried out with regions in other countries to obtain a series of stylized facts, if the results are the same. In addition, given the relatively low —albeit acceptable— value of the explained variance in each simultaneous regression (value of R^2) in studies like the one carried out here, especially in relation to the variable «entrepreneurial intention,» the explanation may be that because of the scope of the study, explanatory variables that may have a significant impact on the independent variables have been left out of our framework of analysis; specifically, those used by the psychological approach, since we do not focus on those psychological variables, but rather on studying the impact of institutional and economic factors on entrepreneurship. Dealing with a short period of time (2004-2010), defined by the availability of regional data from the corresponding GEM reports, means having to work with a relatively small number of observations, which means that our study is eminently exploratory, and as such it would be necessary to have a time series that is much longer to obtain confirmatory conclusions regarding the relationships between variables. With more observations it would also be possible to use the structural equation methodology to make multigroup comparisons, *i. e.* to analyze whether the behaviours differ among Spanish autonomous regions as regards the relationships between the variables considered. These limitations are in themselves future lines of research to be undertaken in subsequent studies.

The results of our study support the conclusion that for the Spanish regions as a whole in the 2004-2010 period, the perception of abilities (self-efficacy) positively

and significantly affects both entrepreneurial intention (H1) and the perception of business opportunities (H2). Predictive evidence for the hypotheses is consequently provided by Boyd and Voizikis (1994), Krueger and Brazeal (1994), Chen *et al.* (1998), Burke *et al.* (2002), Arenius and Minniti (2005) and McGee *et al.* (2009), among others.

One of the aspects that is most frequently mentioned in the literature on entrepreneurship is that among other factors, the intention or desire of individuals to create businesses is determined by the perception of valuable business opportunities (Arenius and Minniti, 2005; Roure *et al.*, 2007; Koellinger *et al.*, 2007). When this relationship was confirmed in our study (H3), this provided evidence that individuals' judgement of their own ability to identify business opportunities is one of the main cognitive factors affecting the entrepreneurial spirit or intentions (Baughn *et al.,* 2006). However, as it is not significant, the ease of access to financing sources (H4) does not appear to affect entrepreneurial desires or intentions, although the estimated parameter has the expected sign. A possible explanation for the result obtained lies in the fact that access to sources of financing by entrepreneurs may have a greater influence in times of recession, when it is an obstacle or barrier to entrepreneurship, but are not an influence in periods of expansion when access to funding for new business initiatives is easier. On the other hand, perhaps the ease of access to financing sources is more closely related to the decision to create a new business than to the prior intention to do so.

This study provides evidence that the perception of business opportunities is determined, in addition to the perception of abilities (self-efficacy) discussed above, by a high priority on entrepreneurship in government economic policy (H5) (Van Stel *et al.*, 2005; Wennekers *et al.*, 2005), and by two economic factors: *a)* the unemployment rate (H11), in the sense that the higher the percentage of the population that is unemployed, the lower the perception of business opportunities, *i. e.* as the purchasing power of the population is reduced, entrepreneurs identify fewer entrepreneurial opportunities (Uhlaner and Thurik, 2007), and *b)* the rate of inflation (H12), because as inflation increases, the perception of opportunities by entrepreneurs increases, in the sense that a higher level of prices for products and/or services may lead to increased expectations of earnings by the entrepreneur, which can clearly be seen as a business opportunity that allows for a high level of success in the new venture, thereby corroborating the approaches of Shapero (1978) and Gibb and Ritchie (1982).

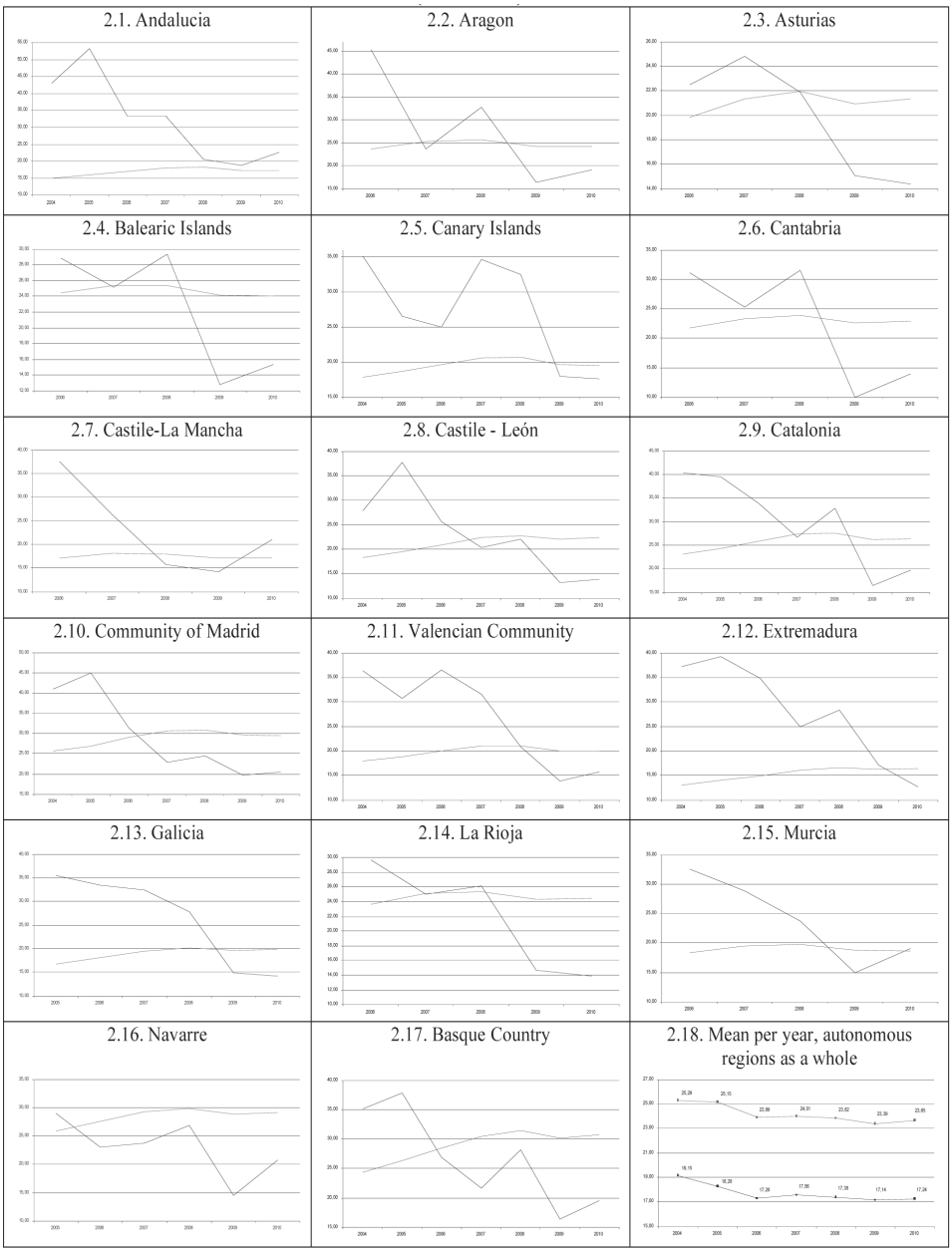
The degree of dynamism of the market (H9) has a significant relationship with the perception of business opportunities, albeit with a negative sign, contrary to expectations. In other words, contrary to the argument made by Levie and Autio (2008), when market dynamism increases, the perception of opportunities is observed to decrease. A possible explanation could be that the dynamism of the market, understood as the level of changes that occur in the market in which competition between companies takes place, can be both positive (it really means opportunities) or negative (it creates threats). In this respect, the relationship between the two variables would really be positive if the changes led to market opportunities, but negative if the changes

involved threats to the business, as seems to be the case in the years analyzed, as a result of the impact of the recessive economic cycle. Additionally, another possible factor that may have an impact on this relationship is the different level of productive specialization in each Spanish autonomous region, which would mean that each one has a substantially different level of dynamism depending on the sectors in which they specialize, and that this in turn generates different perceptions of business opportunities depending on the sector and region. Another possible reason for the result obtained is that the market dynamics are measured in the GEM study based on the aggregation of experts' opinions, where the subjective assessment criteria of the experts consulted in each region are based on various parameters depending precisely on the different dynamism in the fields of specialization of each region.

The regional GDP per capita has a negative effect on the perception of business opportunities (H10); contrary to the expected result. One possible explanation could be the influence of the change in the trend in entrepreneurial intention or desire of the population and the change in the economic cycle (expansion until mid-2007 and recession since then) in that relationship, with a predominance of observations in which the perception business opportunities declines when GDP per capita increases, resulting in a negative correlation between the two variables, which in turn causes the negative (but significant) parameter obtained. Furthermore, the relationship between the variables of perception of business opportunities and GDP per capita presents uneven trends for each region. When they are considered together in our study, the positive trends in the different Regions are offset by negative trends in others, as shown in figure 2. However, if we consider the relationship between the two variables at a national level, *i. e.* the mean of all the autonomous regions for each year, there is a clear and obvious positive relationship (with a correlation coefficient of 0.95) between GDP per capita and the perception of business opportunities (see figure 2.18), that is fully consistent with the theoretical approaches set out above. Consequently, the negative relationship found between the two variables is due to the regional disaggregation performed in our study, which in our view ends up distorting the positive relationship that exists at a national level. This leads us to believe that there are different behaviours in each Spanish region as regards the impact of GDP per capita in the perception of opportunities and entrepreneurial intentions, which are motivated by other factors, such as different regional productive specializations, the cultural differences as regards entrepreneurship between the different Spanish regions, etc. This raises the need to continue investigating the regional differences in order to improve understanding of the entrepreneurial phenomenon.

A significant parameter is obtained for the government regulation variable (H6), but contrary to expectations, it has a positive sign, *i. e.* the more regulation, the greater the perception of opportunities, which is indeed surprising. One possible explanation for the result obtained is that Spanish business culture has had a long-standing and strong dependence on government supervision, meaning that Spanish entrepreneurs perhaps generally feel more comfortable with high levels of regulation that protect them from uncertainty. This is mentioned by Tortella (1994:333-334), when he says that «the weakness of the entrepreneurial spirit is emphasized by [...] the great pro-

Figure 2. Relationship between the variables of perception of business opportunities and GDP per capita, by Spanish Autonomous Regions for each year (2004-2010)



pensity of Spanish entrepreneurs to seek protection from the State to provide them with income and protect them from the competition».

By introducing a parameter that is not significant, government programmes promoting entrepreneurship (H7) do not affect the perception of opportunities. This could be explained by the fact that these programmes affect the entrepreneurial process after a time lag.

Finally, the entrepreneurship education and training that takes place in the education system has no influence on the perception of opportunities (H8); from which it follows that the training in entrepreneurship and business management that takes place in secondary and higher education is of relatively little use in promoting entrepreneurship among the younger generations, and therefore does not enable them —at least immediately— to perceive opportunities to create new businesses. In our view, the reason for this is twofold. On one hand, this training has an effect on long-term entrepreneurial activity, *i. e.* it provides the stimulus for some students to become entrepreneurs, which will not materialize until some years later, after they have gained experience in the labour market and perceive that they possess the necessary skills. On the other hand, as noted by García Tabuenca *et al.* (2008), higher education is not a necessary condition for entrepreneurship, and there is even some empirical evidence that identifies early academic dropout with success in business.

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Section ARTICLES

Investigaciones Regionales

The influence of individual perceptions and the urban/rural environment on nascent entrepreneurship

Joan-Lluís Capelleras *, Ignacio Contín-Pilart **, Victor Martin-Sanchez *, Martín Larraza-Kintana **

ABSTRACT: Individual perceptions have been shown to affect the decision to start a new firm. This decision is also contingent upon the context in which actions are taken. However, not much is known about the joint impact of entrepreneurs' perceptions and the urban/rural environment where the firm is created. The purpose of this paper is to examine how nascent entrepreneurship is influenced by individual perceptions and the urban/rural context. Using data from the Spanish GEM project, the results of a series of logistic regression models indicate that opportunity perception and self-efficacy have a positive influence on the probability of becoming a nascent entrepreneur. Interestingly, we also find that individuals in rural areas who perceive new opportunities are more likely to become nascent entrepreneurs rather than those who live in urban ones.

JEL Classification: L26; R00.

Keywords: nascent entrepreneurship; individual perceptions; urban/rural environment.

La influencia de las percepciones individuales y el entorno rural/urbano en la actividad emprendedora naciente

RESUMEN: Las percepciones subjetivas de los emprendedores han servido para explicar la decisión al emprender una nueva iniciativa empresarial. Sin embargo,

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esta decisión también está influida por el entorno en el que se toma. En este sentido, existe poca literatura sobre el impacto conjunto de las percepciones de los emprendedores y el entorno rural o urbano en el que se crea la empresa. Por ello, el propósito de este artículo es analizar cómo el emprendimiento naciente está condicionado por las percepciones individuales y el entorno, rural o urbano, en el que se ubica el emprendedor. Los resultados de una serie de modelos de regresión logística sobre los datos del proyecto GEM para España, indican que la percepción de oportunidad y la confianza en las propias habilidades tienen un impacto positivo en la probabilidad de convertirse en emprendedor naciente. Asimismo destaca que, en comparación con los individuos que residen en entornos urbanos, los individuos en áreas rurales que perciben oportunidades tienen una mayor probabilidad de convertirse en emprendedores nacientes.

Clasificación JEL: L26; R00.

Palabras clave: emprendimiento naciente; percepciones individuales; entorno rural/urbano.

1. Introduction

The last few decades have witnessed a proliferation of studies which have investigated what factors influence the individual's decision to create a new firm. As such, demographic and economic characteristics of entrepreneurs such as their age or personal income were considered to be the main individual driving forces of entrepreneurial activity for a long time, particularly in the small business economics literature (Arenius and Minniti, 2005). There has also been explanations of the determinants of entrepreneurship which have been based on the entrepreneurs' human and social capital attributes (Davidsson and Honig, 2003) such as previous work or professional experience (Malecki, 1997) or the presence of role models in the entrepreneurs' social networks (Gnyawali and Fogel, 1994, Bosma *et al.*, 2012; Larraza-Kintana and Contín-Pilart, 2013).

In addition to these individual characteristics, which are to some extent objectively measurable individual attributes, subjective perceptions have more recently been added as important determinants of entrepreneurship (Arenius and Minniti, 2005; Koellinger *et al.*, 2007). This set of variables refers to entrepreneurs' perceptions and judgements about their own capabilities or environmental conditions that surround them, what might lead to a final decision with respect to creating a new business. Although these perceptions might be biased, they are likely to be related with an individual's decision to start a new firm. This is based on the notion that the essence of entrepreneurship is about having «a different perception of the situation» (Casson, 1982: 14).

However, the decision to start a new firm is also contingent upon the specific context in which actions are taken (Arenius and Minniti, 2005). Local availability of resources, regional market growth or socio-cultural attitudes towards firm ownership can have an important influence on this decision (Bergmann and Sternberg, 2007; Gnyawali and Fogel, 1994). The distinction between urban and rural areas has also

been shown to be relevant to explain the determinants of entrepreneurship. Population size and density, the most straightforward indicators that are used to distinguish between urban and rural environments, have been found to positively affect entrepreneurship (*e. g.* Reynolds *et al.,* 1994; Wagner and Sternberg, 2004; Stam, 2009). Empirical evidence has indicated that entrepreneurship in urban areas flourishes mainly because of localization effects, urbanization effects and the creative class argument (Glaeser *et al.*, 2010). In addition, it has been pointed that rural areas present obstacles that hamper entrepreneurial activity such as lack of access to financial resources (*i. e.* venture or equity capital), lower concentration of knowledge about establishing and operating a new business or depopulation (Busenitz *et al.,* 2000; Meccheri and Pelloni, 2006).

Overall, entrepreneurship is the result of the interaction between entrepreneurs' attributes and the surrounding environment. In this vein, recent literature reviews have suggested that a deeper research on the linkage between individual attributes and the external context is still needed (Trettin and Welter, 2011). In particular, not much is known about the joint influence of subjective perceptions of nascent entrepreneurs and the urban/rural environment where the firm is created. Several studies have concentrated on motivations of urban and rural entrepreneurs (Freire-Gibb and Nielsen, 2010), their access to human and financial capital (Marshall and Samal, 2006) or the the gender differences in entrepreneurship across urban and rural areas (Driga *et al.*, 2009; Savitha *et al.*, 2009; Davis, 2011). Other studies have examined the influence of institutional factors on the determinants of entrepreneurial activity in different locations (Vaillant and Lafuente, 2007; Bosma and Schutjens, 2011).

Despite this increasing interest in the links between individual characteristics of entrepreneurs and the urban/rural environment, there is still a need to examine the role of such setting in the relationship between individual perceptions and nascent entrepreneurship. Hence, it appears that additional explanations of the interaction between entrepreneurial perceptions and territorial distinctions between rural and urban contexts are still lacking. In the light of this shortcoming, the purpose of this study is to examine how nascent entrepreneurship is influenced by individual perceptions and the urban/rural environment. We first examine the relationship between personal perceptions and the decision to become an entrepreneur. Second, we investigate how such perceptions interact with the rural/urban context to have an influence on the likelihood of becoming a nascent entrepreneur. The study is aimed at furthering our understanding of nascent entrepreneurship by looking at both subjective perceptions of firm founders and the location of their businesses. This is the main novelty of this paper to this area of research. As previously stated, urban and rural areas mainly differ in the availability of resources entrepreneurs have access to. Our study will allow us to empirically examine whether and how such a difference interact with perceptual variables to explain nascent entrepreneurship. In this vein our analysis complements previous ones by exploring how resource availability, here represented by the rural/urban distinction, moderates the connection between individual perceptions about opportunities and skills that precede entrepreneurial action, and the observed rates of entrepreneurship.

The remainder of the work is organized as follows. The theoretical background and hypotheses are presented in the second section. The third section presents the data, method and variables. The results from a series of ordinal logit models are brought in the fourth section. The final section is devoted to the conclusions and implications from the findings.

2. Theoretical background and hypotheses development

2.1. Nascent entrepreneurs and individual perceptions

A nascent entrepreneur is considered a person who initiates actions which are intended to culminate in a new firm (Reynolds, 1994). Hence, nascent entrepreneurs are those individuals who are in the process of business emergence and have initiated several start-up activities. Since perceptions play a key role in the entrepreneurship context, this paper utilizes a perceptions-based approach to predict the decision to become an entrepreneur. By focusing on nascent entrepreneurs, in this paper we are able to identify perceptual differences among individuals who are implementing a new firm.

In fact, most of the economic literature related to entrepreneurship traditionally focused on the individual's decision to become an entrepreneur as a result of a maximization process *i. e.* a comparison between the returns from alternative activities and the selection of the employment opportunity with the highest expected return. As argued by Arenius and Minniti (2005), this approach should be complemented by incorporating variables describing personal perceptions of the nascent entrepreneur. In effect, the decision to become an entrepreneur tends to be based more on subjective and often biased perceptions rather than objective expectations of potential success (Koellinger *et al.,* 2007). Our approach in this paper is based on the nascent entrepreneurs' subjective perceptions rather than general attitudes toward entrepreneurship (*e. g.* Krueger, 1993). More specifically, we focus on entrepreneurs' perceptions of their own skills for entrepreneurship and the venture opportunity.

Opportunity perception has been considered the most distinctive characteristic of entrepreneurial behavior. For instance, Casson (1982) highlighted that the essence of entrepreneurship is related to different perceptions about the environment. In fact, the idea that entrepreneurial action requires the perception of opportunities is based on the premise that individuals make decisions based on subjective assessments rather than on objective factors (*e. g.* Penrose, 1959; Ajzen and Fishbein, 1980). Prior research related to the theory of planned behaviour has shown that evaluative judgments are important predictors of intentions and subsequent actions of individuals (Doll and Ajzen, 1992; Malhotra, 2005). Since individuals have different expectations and assessments about the environment (Palich and Bagby, 1995; Dew *et al.*, 2004), the perception that new opportunities exist in the market would better predict venture creation rather than the objective environmental conditions. In this context,

Edelman and Yli-Renko (2010) suggest that entrepreneur's opportunity perceptions mediate between objective characteristics of the environment and the entrepreneur's efforts to start a new venture.

The effectuation perspective (Sarasvathy, 2001) also provides insights into the role that entrepreneurs' perceptions may play in the venture creation process. This perspective assumes a dynamic environment where the future is difficult to predict. Entrepreneurs thus take actions seeking to control the unpredictable future and this leads them to construct the future. Opportunity is them viewed as a set of subjective expectations of what entrepreneurs think can be accomplished or «imagined ends» (Sarasvathy, 2001). These expectations tend to determine an entrepreneur's behaviour. Following this logic, nascent entrepreneurs' perceptions of opportunities would drive their efforts to start a new venture. For instance, the perception of unexploited market opportunities is likely to lead individuals to initiate start-up activities and persevere in conducting these activities.

In this context, perceptions of nascent entrepreneurs will reflect their personal beliefs about the feasibility of potential opportunities (Dimov, 2010). As a result, nascent entrepreneurs can choose to abandon the opportunities that lack promise and to continue to pursue the ones that are auspicious. Therefore, the progress of the emerging venture is highly dependent on the nascent entrepreneur's perceptions and subjective judgment of the opportunity (Shook *et al.*, 2003; Kor *et al.*, 2007).

Overall, entrepreneurs' perceptions about opportunities are likely to affect positively the likelihood of becoming an entrepreneur. In other words, there will be a positive relationship between perception of opportunities and nascent entrepreneurship. We thus suggest that:

Hypothesis 1: Opportunity perception will be positively related to the likelihood of becoming a nascent entrepreneur.

As is the case with external opportunities, individuals also have different expectations and assessments about their own skills and abilities to successfully set up a new business. Hence, in addition to assessing the feasibility of the opportunity, nascent entrepreneurs also evaluate their ability to establish a new business, *i. e.* whether or not they will be able to establish a venture that exploits the perceived opportunity (Dimov, 2010).

This assessment has to do with the concept of self-efficacy, which was defined by Bandura (1977) as a belief in one's ability to execute actions. Self-efficacy is important because individuals' belief about their ability to perform a task (*e. g.* being an entrepreneur) will affect whether or not they will undertake the task at all. It has been considered to be strongly related to individuals' actual ability (Phillips and Gully, 1997) and performance in general (Locke and Latham, 2002). This is because individuals with a strong sense of self-efficacy will devote a high degree of effort in order to meet their commitments and thus are likely to achieve their goals (Bandura, 1997). In contrast, individuals with low self-efficacy are less likely to make an extended effort, since they believe they cannot be successful.

This notion is in line with intention-based models, in which perceived feasibility has been shown to be a key driver of entrepreneurial intentions (Krueger and Dickson, 1994). Similarly, in Sarasvathy's (2001) effectuation model, an entrepreneur's «given means» form the basis for actions. These given means are perceptual, since they depend upon the entrepreneurs' understanding of their personal identity and experience (Edelman and Yli-Renko, 2010).

In an entrepreneurial context, self-efficacy has been considered as a distinct characteristic of entrepreneurs (Chen *et al.*, 1998; Markman *et al.*, 2002) and an important component of entrepreneurial decision-making (Krueger and Dickson, 1994). Confidence in one's skills and ability to successfully develop entrepreneurial activities is increasingly being considered as a potential determinant of the decision to start a new business, since several studies suggest that entrepreneurial self-efficacy may explain an important part of entrepreneurial activity (Arenius and Minniti, 2005; Zhao *et al.*, 2005; Koellinger *et al.*, 2007; Vaillant and Lafuente, 2007).

Based on previous self-efficacy research, we argue that individuals who have a strong belief in their own capabilities to launch a new firm will exert greater effort in the start-up process and this will contribute to the foundation of their firm. Hence, increased confidence in their own skills can propel entrepreneurs towards the establishment of a new venture, whereas lack of confidence in their own skills can render the nascent entrepreneurs dejected (Dimov, 2010). When nascent entrepreneurs are confident about such skills, they are likely to consider themselves capable to engage in venture creation activities (Hechevarría *et al.*, 2012). Therefore, we anticipate that individuals with confidence in their own entrepreneurial skills (*i. e.* entrepreneurial self-efficacy) will be more likely to start new ventures. In other words, one would expect that confidence in one's skills and nascent entrepreneurship will be positively correlated. Hence, we formulate the following hypothesis:

Hypothesis 2: Entrepreneurial self-efficacy will be positively related to the likelihood of becoming a nascent entrepreneur.

2.2. The role of the urban/rural environment

So far, we have argued that individual perceptions about environmental opportunities and personal skills will have a positive impact on nascent entrepreneurship. What we now propose is that these effects may be affected by the context in which the entrepreneurial process takes place. Such context may enable or constrain entrepreneurs, since it may provide individuals with new opportunities and at the same time may limit their actions (Welter, 2011).

More specifically, we suggest that the urban/rural context will moderate the relationship between individual perceptions and the likelihood of becoming an entrepreneur. This is important because there are marked differences in entrepreneurship

across space. Such differences occur mainly because of differential returns to entrepreneurship, differential availability of resources, and differences in the local culture (Glaeser *et al.*, 2010).

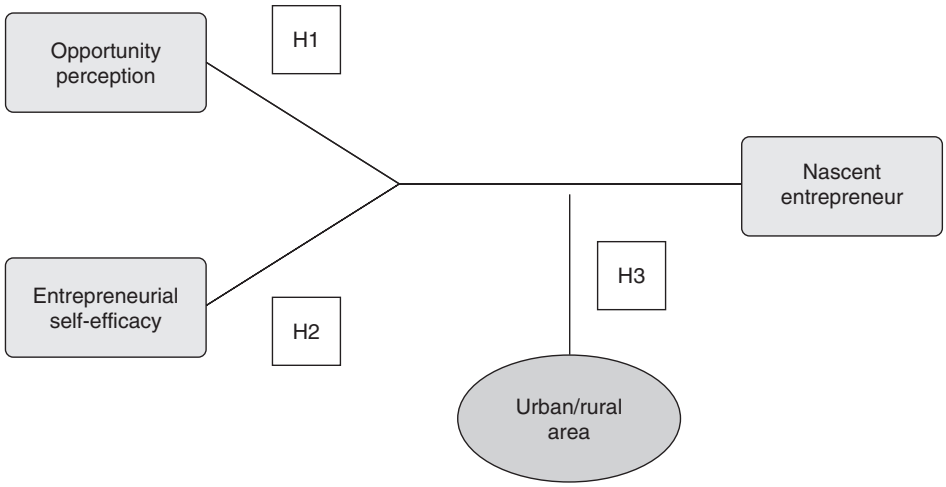
In fact, urban agglomerations have traditionally been portrayed as the preferred setting for conducting business (Marshall, 1920; Jacobs, 1969). Literature on economic geography has shown the advantages of highly dense areas (Todling and Wanzenbock, 2003; Van Stel and Suddle, 2008). The potential benefits these areas offer to new firms are primarily access to critical resources like financial and technological resources, relatively higher human capital levels, and a high stock of knowledge about establishing and operating new businesses. In addition, urban areas offer greater proximity to markets, a diversified economic base and a large market in terms of suppliers, customers and services (Wagner and Sternberg, 2004; Meccheri and Pelloni, 2006; Buseniz *et al.*, 2000; Felzenstein *et al.*, 2012). Higher population density areas also offer individuals trying to set up a business more observation possibilities before engaging in new projects (Shane, 2003). In contrast, rural entrepreneurs suffer more difficulties to access to key financial, technological, human and knowledge related resources than urban entrepreneurs, and lack certain benefits related to low density of population such as a lower density of markets and a greater distance to resources (Malecki, 2003).

Such important benefits for potential entrepreneurs in urban areas, in particular the availability of key resources, are likely to favour individuals in urban areas undertake the step that takes them from individual perceptions about opportunities and necessary skills to actually launch the business and become real entrepreneurs. Even though urban areas are at the same time more competitive environments, one would expect that founding a firm in an urban setting would moderate positively the relationship between individual perceptions and the likelihood of becoming an entrepreneur. This is because the positive impact of perceptions on the likelihood of becoming an entrepreneur will be higher when individuals perceive environmental conditions as favourable (Davidsson, 1991). That is, people will be more receptive to exploit entrepreneurial opportunities and perceive themselves as being more apt to become entrepreneurs in urban than in rural areas, due to its relatively advantage to access to financial, technological and other key entrepreneurial resources. Hence, we offer the following hypothesis:

Hypothesis 3: The positive impact of opportunity perception and entrepreneurial self-efficacy on the likelihood of becoming a nascent entrepreneur will be higher in urban environments.

In sum, our approach is to suggest that perceptions about opportunities and skills will have a positive influence on nascent entrepreneurship. We also propose that there will be a positive moderating effect of residing in an urban area on the relationship between the perceptual variables and the likelihood of being a nascent entrepreneur. This is reflected in the conceptual model of the study, as shown in figure 1.

Figure 1. Conceptual model



3. Data and methodology

3.1. Data and sample

Data used in this paper are from the Spanish Global Entrepreneurship Monitor (GEM) project 2008. GEM project is an annual assessment of the entrepreneurial activity, aspirations and attitudes of individuals across a wide range of countries. In each country, a standardized survey is administered to a representative sample of adults (18-64 years old). To better distinguish between rural and urban areas, the GEM project uses Kayser (1990) criterion. This criterion is based on demographic figures and considers areas that have less than 5,000 inhabitants as rural municipalities. Opposite, municipalities with populations greater than 5,000 inhabitants are considered to be urban ones. The original database for the present study contains the responses to the adult population survey of 30,879 Spanish individuals in 2008.

3.2. Variable measurement

Nascent entrepreneur. This is a dummy variable that takes the value of 1 if the individual is a nascent entrepreneur and 0 otherwise. A nascent entrepreneur is anybody who at the moment in which the survey is conducted is in the process of setting up a business that he or she (partly) owns and that has not yet paid wages or salaries for more than three months (Reynolds *et al.*, 2005; Davidson and Honig,

2003). Our data set indicates that the proportion of nascent entrepreneurs in Spain in 2008 was 5.4%.

Perceptual variables. According to the hypotheses and arguments presented above we consider two perceptual variables in the study: opportunity perception and entrepreneurial self-efficacy. *Opportunity perception* is a dummy variable taking value 1 if the interviewed person sees good opportunities to start up a business in the following six months and 0, otherwise. *Entrepreneurial self-efficacy* is also a dummy variable that takes value 1 if the individual thinks that he or she has the skills and experience to start a new bussiness.

Urban area. To account for the geographical location of the entrepreneur we have the variable urban area that takes value 1 if the individual lives in an urban area and 0 when the interviewed person resides in a rural area. As noted above the GEM project uses Kayser (1990) criterion to classify urban and rural areas. This criterion is based on demographic figures and considers areas that have less than 5,000 inhabitants as rural municipalities, while those with more than 5,000 inhabitants are coded as urban. To test Hypothesis 3, that states the moderating role of the area of residence on the impact that individual perceptions have on entrepreneurial activity, we interact the variable urban area with the perceptual variables described above. Hence we create two new variables: opportunity perception*urban area and entrepreneurial self-efficacy*urban area.

Control variables. We first control for the respondents *age* and *gender*. While the former is measured in years, the latter takes value 1 if the individual is a male and 0 otherwise. Moreover, we also control for the labor status of the interviewed person through a dummy variable that takes value 1 if the individual is currently working and 0 otherwise. Level of education is measured by a dummy variable that takes value 1 if the individual has post-secondary (university degree) education and 0 otherwise. Individuals' annual income is also considered. Individuals were classified into three different groups according to their household income. More specifically, they are classified in the upper, middle or lower third of the income distribution of Spain if their household income is between 0 and 40,000 euros, between 40,001 and 80,000 euros or is more than 80,000 euros, respectively. Therefore, three dummy variables capture individuals' wealth.

3.3. Statistical methods

Pearson's correlation matrix and descriptive statistics was the first test we ran to have a general and clear distribution of the sample. Furthermore, in order to test the influence of individual perceptions in the likelihood to become a nascent entrepreneur, we estimated three binomial logistic regressions. In all model specification, the dependent variable takes a value 1 if the individual is a nascent entrepreneur, 0 otherwise. Model 1 estimates the impact of urban and control variables on the likelihood of becoming a nascent entrepreneur. Model 2 adds to the independent

variables included in model 1 the perceptual variables, *i. e.* opportunity perception and entrepreneurial self-efficacy. Finally, model 3 includes the same independent variables as model 2 and adds the interactions opportunity perception*urban and self-confident*urban area. To avoid heteroskedasticity concerns, standard error are clustered by province. As previously stated the sample size contains 18,986 individuals. Because of individual-level missing data, 30,879 respondents were included in model 1, and 15,898 in models 2 and 3 (see table 2).

4. Results

Our empirical analyses are distributed in the following way. Firstly, table 1 provides descriptive statistics and Pearson's correlation matix of the variables. Table 2 presents coefficient estimates by models.

More specifically, table 1 shows that the average respondent age is 41 years and that 50% of the interviewed people are male and the other 50% female. In addition, 83.9% of the individuals from our sample live in urban area. Additionally, 73.1% are currently working and 27.1% have university degree. Regarding income distribution, 35.5% of the individuals from our sample have household incomes between 0 and 40,000 euros, 38% of them between 40,001 and 80,000 euros and the other 26.3% more than 80,000 euros. In relation with the perceptual variables, 25.2% of individuals see good opportunities to start up a business in the area where they live. Besides, 46% of them are confident in their entrepreneurial skills.

With regard to Pearson's correlation matrix, result show that the correlation between opportunity perception and nascent entrepreneur is 0.0907 ($p < 0.001$) and that the correlation between entrepreneurial self-efficacy and nascent entrepreneur is 0.1525 ($p < 0.001$). Table 2 presents the coefficient estimates of three model specifications.

Hypotheses 1 and 2 suggest a positive influence of perceptual variables on the likelihood to become a nascent entrepreneur. The results of the analyses conducted support both hypotheses. The coefficients of the perceptual variables are positive and highly significant in models 1 and 2. On the contrary, the negative and significant effect of the interaction term opportunity perception*urban area coefficient from model 3 not only do not support for Hypothesis 3, but indicates that the impact of opportunity perception on the likelihood to become a nascent entrepreneur is smaller in urban environments.

To gauge a more precise picture of the interaction term just discussed, we plot the significant interaction displayed in model 3. Entrepreneurial activity (*i. e.* to be a nascent entrepreneur) and opportunity perception appear in the vertical and horizontal axes, respectively. Plots represent the influence of opportunity perception by area of residence of individuals.

Table 1. Mean, standard deviation and Pearson's correlation matrix of dependent, independent and control variables [a]

	Mean	*Std Dev*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
1. Nascent entrepreneur	0.054	0.227	1.000												
2. Age	41.591	12.326	–0.0209 ***	1.000											
3. Gender	0.501	0.500	–0.0353 ***	0.0178 ***	1.000										
4. Urban area	0.839	0.367	–0.0082	–0.0120 ***	–0.0040	1.000									
5. Work status: working	0.731	0.443	0.1443 ***	–0.0095 *	–0.2204 ***	–0.0010	1.000								
6. Education: graduate degree	0.271	0.444	0.0224 ***	–0.1386 ***	–0.0056	0.0063	0.1322 ***	1.000							
7. Household income (lowest third)	0.355	0.478	–0.1072 ***	0.0346 ***	0.1013 ***	0.0159 ***	–0.1084 ***	–0.2030 ***	1.000						
8. Household income (middle third)	0.380	0.485	0.1286 ***	–0.0318 ***	–0.0410 ***	0.0019	0.1022 ***	0.1100 ***	–0.5823 ***	1.000					
9. Household income (upper third)	0.263	0.440	–0.0252 ***	–0.0025	–0.0649 ***	–0.0193 ***	0.0052	0.0993 ***	–0.4450 ***	–0.4689 ***	1.000				
10. Opportunity perception	0.252	0.434	0.0907 ***	–0.0167 ***	–0.0702 ***	–0.0035	0.0387 ***	0.0009	–0.0504 ***	0.0007	0.0557 ***	1.000			
11. Entrepreneurial self-efficacy	0.460	0.498	0.1525 ***	–0.0080	–0.0503 ***	–0.0041	0.1277 ***	0.0660 **	–0.0455 ***	0.0317 ***	0.0151 ***	0.0987 ***	1.000		
12. Interaction opportunity perception*urban area	—	—	0.0667 ***	–0.0176 ***	–0.0650 ***	0.2262 ***	0.0349 ***	0.0014	–0.0393 ***	0.0009	0.0431 ***	0.8911 ***	0.0846 ***	1.000	
13. Interaction confidence in one's skills*urban area	—	—	0.1185 ***	–0.0060	–0.0395 ***	0.3456 ***	0.1114 ***	0.0587 ***	–0.0291 ***	0.0235 ***	0.0061	0.0819 ***	0.8587 ***	0.1680 ***	1.000

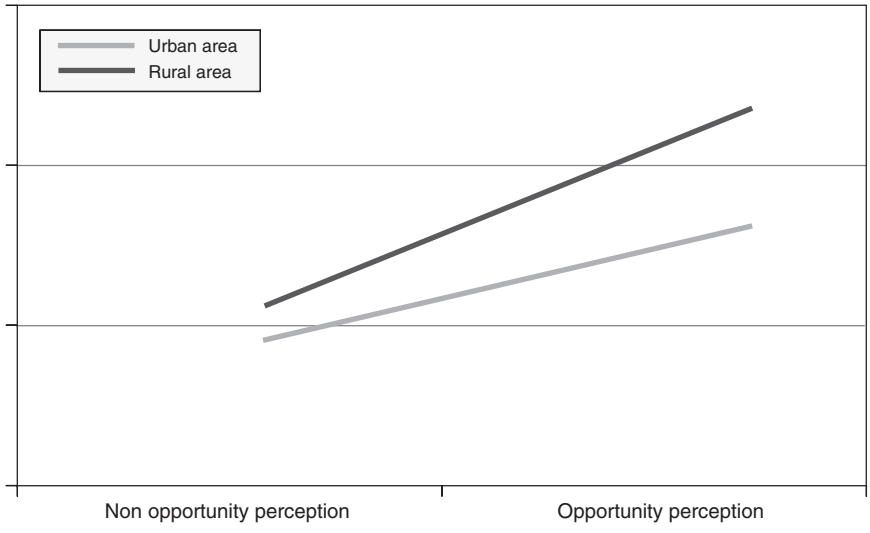
[a] Table reports non-standardised β coefficients. Robust standard errors are in parentheses. Significance levels are based on a two-tailed test for all tests and coefficients.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$.

Table 2. Logistic regression on the likelihood to become a nascent entrepreneur [a]

	Model 1	*Model 2*	*Model 3*
Age	–0.004 (0.003)	–0.014 (0.005) **	–0.015 (0.005) **
Gender	–0.071 (0.072)	0.010 (0.111)	0.013 (0.111)
Work status	5.356 (0.584) ***	4.900 (0.712) ***	4.899 (0.712) ***
Higher education	–0.108 (0.077)	–0.244 (0.117) **	–0.246 (0.117) **
Annual income (lower third)	–0.637 (0.117) ***	–0.607 (0.173) ***	–0.608 (0.173) ***
Annual income (middle third)	0.768 (0.086) ***	0.664 (0.134) ***	0.663 (0.134) ***
Urban area	–0.069 (0.094)	–0.274 (0.138) **	–0.209 (0.429)
Opportunity perception		0.806 (0.108) ***	1.236 (0.251) ***
Entrepreneurial self-efficacy		1.856 (0.164) ***	1.667 (0.388) ***
Opportunity perception*urban area			–0.523 (0.277) *
Entrepreneurial self-efficacy *urban area			0.231 (0.429)
N of observations	18,986	15,898	15,898
Wald chi squared	308.69 ***	293.85 ***	299.4 ***
Pseudo R^2	0.1132	0.1914	0.1925

[a] Table reports non-standardised β coefficients. Robust standard errors are in parentheses. Significance levels are based on a two-tailed test for all tests and coefficients.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$.

Figure 2. The moderating role of the urban/rural environment on the relationship between opportunity perception and the likelihood of becoming a nascent entrepreneur



As per the effect of the control variables, adults and higher educated people are less likely to become nascent entrepreneurs. Individuals who are currently working are more likely to start a new business. The poorest individuals are less likely to be involved in the process of creating a new firm than the richest ones. On the contrary, those individuals from the middle class (Annual income middle third) are more likely to start a new firm than richest persons. Finally, gender does not seem to have any significant impact on the likelihood to become a nascent entrepreneur.

5. Concluding remarks

The findings of the paper point to the importance of individual perceptions as determinants of nascent entrepreneurial activity. The paper shows that opportunity perception and confidence on one's skills tend to significantly increase the likelihood of engaging in start-up efforts. This is line with recent studies which suggest that individuals' opportunity perceptions mediate between objective characteristics of the environment and the individuals' efforts to start a new firm (Edelman and Yli-Renko, 2010). This is also consistent with prior work which shows that entrepreneurial self-efficacy plays an important role in explaining nascent entrepreneurial activity (Arenius and Minniti, 2005; Koellinger *et al.,* 2007).

The study has also explored the potential moderating role of territorial distinctions in the relationship between individual perceptions and nascent entrepreneurship. More specifically, we have distinguished between urban or rural residence of individuals through a dummy variable, which takes value 1 for individuals residing in urban areas. This variable would capture the relatively advantage of urban over rural areas in relation to the availability of entrepreneurial resources. We have argued that this relatively advantage of urban areas would intensify the impact of perceptual variables on the likelihood to become a nascent entrepreneur. Our results show that the urban/rural environment does not significantly moderate the relationship between self-efficacy in one's skills and becoming a nascent entrepreneur. In contrast, we have found that there is a significant moderating role of the urban/rural context on the link between opportunity perception and nascent entrepreneurship. In other words, the importance of perceiving an opportunity is more relevant for nascent rural entrepreneurs rather than for their urban counterparts. This means that individuals who perceive an opportunity in rural areas are more likely to become a nascent entrepreneur. This result may be explained by the fact that employment choices individuals face when they have to decide between starting a new firm or being wage employees vary greatly by their area of residence. Specifically, similar to the previously noted advantages of urban areas in terms of resource availability or market size, urban areas are also characterized by more dynamic and diversified economic activity which creates more opportunities to find salaried employment opportunities. Hence, residents in urban areas who may perceive entrepreneurial opportunities may decide not to pursue them and become salaried employees if they anticipate higher expected returns from the salaried jobs (Arenius and Minniti, 2005). In contrast in rural areas, in which the

economic activity and the labour market are less lively, residents who perceive business opportunities may be forced to pursue them. In this vein it may be interesting to analyse in a future study whether the observed greater entrepreneurial activity of rural areas is more necessity driven than in urban ones.

In addition, recent improvements in infrastructures, information technologies and institutional framework in rural regions might also have been beneficial for nascent entrepreneurs (Vaillant *et al.*, 2007). In the words, these developments may have bettered the conditions for rural entrepreneurs to exploit the opportunities they have discovered (Shane, 2003).

Nonetheless, we should keep in mind that our variable urban only captures the environment in which adult population lives, and therefore does not consider infrastructure, migration movements, role models, social networks or support agencies. Therefore while valuable, our dummy variable (*i. e.* urban area) may be seen as a coarse measure to capture the resource availability that lies behind our argument. In the future it would be interesting to develop a more precise measure of the resources available for entrepreneurs who reside in different geographical locations.

All in all, one implication of the findings lay in the strong support in favour of analysing personal perceptions when researching early stage entrepreneurship at the individual level. As suggested by prior work in this area, nascent entrepreneurs' perceptions tend to drive their efforts to start a new venture. In this context, the findings indicate a positive influence of perceiving good business opportunities in rural areas on the probability to become a nascent entrepreneur.

This calls for further research in this issue, as this paper is a first step towards a better understanding of the joint role of both perceptual factors and territorial distinctions as determinants of nascent entrepreneurship. Our study is limited by the binary nature (yes or no) of the majority of independent variables, which may eliminate the possibility of observing, with a greater degree of precision, the relationship between the variables. This in fact represents a necessary simplification due to limitations of the database.

Additionally, a longitudinal approach is recommended in order to evaluate the changes over time in the relationship between nascent entrepreneurs' perceptions in the context of urban and rural areas. A better understanding of temporal events such as creating a new firm will also require additional methodologies. In effect, there is a need for future research that explores the actual processes of venture creation and temporal transitions by using a case study approach. This would contribute to a better examination of how perceptions evolve over time in the venture gestation process depending on the environmental context.

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Section ARTICLES

Investigaciones Regionales

Social and human capital as determining factors of entrepreneurship in the Spanish Regions

Isabel Neira *, Marta Portela *, Maite Cancelo *, Nuria Calvo **

ABSTRACT: Entrepreneurship, innovation and creativity are considered key factors of the economic growth because they usually bring on behaviors aligned with the market development, productivity and social cohesion. This study aims to analyze the factors that influence the entrepreneurial role, and provide a better understanding of this behavior from a dynamic perspective, in order to support policies for encouraging entrepreneurship. To do this we used the data presented in the report of the Global Entrepreneurship Monitor (GEM), in its 2011 edition, which is based on an empirical analysis of a sample of 27,000 Spanish citizens.

The results confirm that the perception of market opportunities, and having the skills and knowledge required to create new companies are explanatory factors of the entrepreneurial activity. However, it is also possible to assert that the increase of the entrepreneurial activity rate motivated by the need of self-employment of the entrepreneur influences the increase of fear of failure, and this could generate a dynamic harmful to the business creation in the medium term.

Our model aims to support the decisions of public institutions about the incentive measures for entrepreneurs. This work contributes to the study of entrepreneurship and business creation from a multidisciplinary perspective, incorporating psychological, sociological and economic approaches from a dynamic perspective. It also allows an in-depth analysis of factors undetected with other methodologies.

We examined the determining factors of entrepreneurship by estimating a logit model based on entrepreneur's social capital (networking) and the geographical location (region) of the business activity. This analysis has shown significant differences of these factors according to the stage of the entrepreneurial process. These results have let discuss the implications for the entrepreneurial dynamic, in order to support new policies in favor of entrepreneurship.

JEL Classification: L26.

Keywords: determining factors of entrepreneurship; regional development; social capital; human capital.

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Capital social y humano como determinantes del emprendimiento en las regiones españolas

RESUMEN: El emprendimiento, la innovación y la creatividad son considerados factores claves para el crecimiento económico porque se consideran que son elementos que impulsan el desarrollo del mercado, la productividad y la cohesión social. Este estudio tiene como objetivo analizar los factores que tienen relevancia en el papel emprendedor y proporcionar una mejor comprensión de este comportamiento desde una perspectiva dinámica, con el fin de apoyar las políticas de fomento del espíritu empresarial. Para ello se utilizaron los datos presentados en el informe del Global Entrepreneurship Monitor (GEM), en su edición 2011, que se basa en un análisis empírico de una muestra de 27.000 ciudadanos españoles.

Los resultados confirman que la percepción de oportunidades de mercado y el tener las herramientas y el conocimiento necesarios para crear nuevas empresas son factores explicativos de la actividad emprendedora. Sin embargo, es posible afirmar que el incremento de la tasa de actividad emprendedora motivada por la necesidad del auto-empleo influye en el aumento del miedo al fracaso y esto podría generar una dinámica perjudicial en la creación de empresas a medio plazo.

Nuestro modelo tiene como objetivo apoyar las decisiones de las instituciones públicas sobre las medidas de incentivo para los empresarios. Este trabajo contribuye al estudio de la iniciativa empresarial y la creación de empresas desde una perspectiva multidisciplinar, incorporando enfoques psicológicos, sociológicos y económicos desde una perspectiva dinámica. También permite un análisis en profundidad de los factores detectados con otras metodologías.

El trabajo examina los factores determinantes del emprendimiento utilizando un modelo logit basado en el capital social de los emprendedores (redes sociales) y la localización geográfica (región) de la actividad empresarial. Este análisis muestra que existen diferencias significativas en esos factores en función de la etapa del proceso emprendedor. Esos resultados permiten discutir las implicaciones para la dinámica empresarial con el fin de apoyar nuevas políticas a favor de la iniciativa empresarial.

Clasificación JEL: L26.

Palabras clave: determinantes de emprendimiento; desarrollo regional; capital social; capital humano.

1. Introduction

Entrepreneurship is one of the main drivers of innovation, competitiveness and economic growth. For this reason, in the current economic dynamic, the creation and consolidation of new companies capable of moving the market has become one of the biggest challenges to be faced by political institutions.

Some factors play a key role in the entrepreneurship process. The detection and exploitation of the market opportunities, overcoming the administrative and financial

obstacles or the need to acquire new knowledge and skills are some of the many variables involved in the process.

For this reason, entrepreneurial motivation is conditioned by a set of factors acting as stimulus or barrier in developing the entrepreneurial spirit in individuals. These factors usually are grouped for analysis into three groups: socio-demographic factors, perception variables and contextual factors (both social and economic). All have been the subject of numerous studies in recent decades, due to increased interest emerged around entrepreneurship and the design of measures to promote it in different countries.

One of the most important variables when conducting empirical studies is the ability to perceive economic opportunities of the new business (Shane, 2003:105; Lundström and Stevenson, 2005), because the core of entrepreneurship usually is related with the focus on the market opportunities. Thus, an individual will be encouraged to set up a new company if he or she detects that there is a business opportunity that can be exploited (Shane, 2003).

This study aims to analyze the determining factors of entrepreneurship, that is, what are the variables that have a greater influence on the individual when deciding to carry out an entrepreneurial activity. Our evidence is based on the database provided by the GEM project survey (Global Entrepreneurship Monitor) to assess the level of entrepreneurial activity, aspirations and attitudes of individuals across a wide range of countries.

This study is organized as follows. Section 2 introduces a review of the previous studies which were focused on the determining factors of entrepreneurship. Section 3 details the methodology used and the definition of the variables included in the econometric model. Then we discuss the results obtained and we present the conceptual model that shows the entrepreneurial dynamic using the variables detected (Section 4). Finally, in Section 5 the conclusions of the study are provided and incentive measures are proposed to promote a favorable entrepreneurial dynamics for future business creation.

2. Determining factors of entrepreneurship

According to the focus of the decisional models of career choice, entrepreneurship behavior is considered as a result of a complex decisional process through which the individual chooses his professional future between the alternatives of starting his own business or work for others (Baumol, 1990; Campbell, 1992; Douglas and Shepherd, 2000).

In recent years, there has been growing interest in studying the relationship between innovation, entrepreneurship and economic development. In fact, it is a general assumption that innovation directly affects the economic development of the countries. For this reason, one of the factors to take into account when analyzing the success of entrepreneurship is its innovative character. Actually, the success or failure

of a new business may be mostly determined if the entrepreneur is able to detect this innovative opportunity that lies in the environment.

Following the approach of the previous studies, we consider that the factors influencing the individual decision of running an own business instead of choosing paid employment can be classified as:

— **Individual factors:** such as demographic characteristics (sex, age, marital status, family status), health, income, current job status, individual human capital (education, experience), personal psychological characteristics (attitudes, optimism, preference for independence), analyzed by the authors involved in the psychological approach of entrepreneurship (McClelland 1961; Carsrud and Johnson, 1989). In addition to previous studies, Guerrero, Scepter, M. J. and Urban, D. (2008) focus their work on the perception that college students have of the desirability and financial viability of running a business project.
— **Social factors:** those related with the existence of social capital and social performance standards that support entrepreneurial initiatives. This factors have been discussed from the sociological approach of entrepreneurship (Shapero and Sokol, 1982; Aldrich and Zimmer, 1986; Busenitz *et al.,* 2003; Doh *et al.,* 2011).
— **Macroeconomic factors:** such as per capita income, the financial system and credit rating or the economic cycle. Their influence on entrepreneurship is studied from the economic approach, (Audretsch and Thurik, 2001; Audretsch and Keilbach, 2004; Sternberg, Wennekers, 2005).

The review of the literature shows that there is no consensus on the effect of each of these factors on the entrepreneurial decision. The authors' conclusions differ, depending on the scope of analysis, either among the countries studied or depending on the industry addressed.

In this paper we integrate the psychological, sociological and economic approaches of entrepreneurship, analyzing on the first place the characteristics that differentiate entrepreneurs (psychological approach), and later integrating this analysis in other issues identified in sociological and economic approaches.

As starting point of the analysis, it is necessary to identify the relevance of the variables age, gender, education, perception (confidence and risk aversion) and macro-economic context in previous studies of entrepreneurship.

— **Age:** entrepreneurial spirit tends to be developed in young people. Thereby, Reynolds *et al.* (2003) found empirical evidence showing how individuals aged 25 to 34 were the candidates who were more likely to become entrepreneurs.
— **Gender**: regarding gender differences, although some studies have found that factors influencing entrepreneurship of women and men are similar (Langowitz and Minniti, 2007), other studies show the opposite, particularly in relation to perception. Mueller and Conway Dato-On (2008) showed that men feel more attracted to entrepreneurship because they have higher

levels of self-confidence for managing this role. Green *et al.* (2003) claim that women differ from men in their choice of entrepreneurship option. Likewise, Sánchez-Escobedo *et al.* (2011) analyze the different socioeconomic and psychosocial factors that differentiate men and women throughout the entrepreneurial process. There is research to show that women perceive their environment as more difficult and less appropriate to carry out such entrepreneurial activity, and this perception leads them to reduce their ambition when they run a new firm (Zhao *et al.*, 2005; Carter *et al.*, 2001). Following this approach, women identify entrepreneurial opportunities from another way (DeTiene and Chandler, 2007), and have a different entrepreneurial self-image than men (Verheul *et al.*, 2004). This mix of factors helps us to explain why the rate of entrepreneurship of women is lower that men's in most countries. In addition to previous studies, Green (2000) refers to the differences in the stock of human capital and social capital between individuals of both sexes, an approach that is confirmed in other studies such as Martinez Mateo *et al.* (2012). In this sense, the study of Alvarez *et al.* (2012), based on GEM data, states that informal factors (perceived ability to run a new business, social networks and family role) have a significant effect on the probability of being a woman entrepreneur, while other formal factors as financing, supportive policies (non-economic) and training do not have a differential effect on entrepreneurship in terms of gender.

— **Education:** literature considers education as one of the main indicators of human capital. However, often entrepreneurs stand out more because of his talent than because of the specific education that they have previously received (Murphy *et al.*, 1991; Leazar, 2002). For this reason, the relations between education and the creation of new businesses are uncertain, except for those rich countries that have shown that postgraduate training has positive effects on the implementation of high-tech entrepreneurship (Blanchflower, 2004). However, entrepreneurs (whether incipient or potential) tend to have a higher educational level on average than the rest of the workforce and also higher than established entrepreneurs (Contin *et al.,* 2007).

— **Perception:** although the influence of socio-demographic and economic factors on entrepreneurship have been extensively analyzed in the literature, it does not happen with the variables related to the entrepreneur' perception (psychological approach), due to the limited data available and to the complexity of introducing these variables into traditional models of study. Entrepreneur's perception is studied through those factors that describe subjective perceptions and beliefs not explained by objective circumstances. These variables are considered the most important distinguishing features of the behavior of entrepreneurs (Kirzner, 1973, 1979).

— **Confidence and social capital:** literature offers many studies examining the relationship between trust in the individual's skills and his ability to start a new business (Vázquez, Gómes and Vieira, 2010; Doh and Acs, 2010). Following this approach, other studies emphasize the importance of meeting individuals who have already start new business for the future entre-

preneur, *i. e.,* entrepreneurial networks of support. In this sense, Minniti (2004) analyzed the increased confidence of individuals which is generated by the existence of prior entrepreneurship role models, and the effect that this knowledge has in reducing the perception of risk environment for the potential entrepreneur. It also confirms the influence of the lack of entrepreneurial role models in the low rate of entrepreneurship of different groups, such as women (Justo and Diaz, 2012). In the same vein, Doh and Zolnik (2011) built the concept of social capital based on three constructs: trust (generalized and institutional), associative activities (passive and active) and civic norms, and they found out a positive relationship between the stock of social capital treasured by an individual and his entrepreneurial propensity. Going into the analysis of entrepreneurial networks, Bauernschuster *et al.* (2010) concluded that belonging to small social communities increases the propensity to start a new business more than being member of larger communities.

Entrepreneur's trust on their own skills, belonging to entrepreneurial networks and social norms are variables that allow us to measure the concept of social capital. Social capital can have a positive influence on the exploitation of market opportunities because it facilitates the acquisition of resources and organizing efforts in the implementation of the new business. In this regard, González *et al.* (2012) obtained a positive and significant relationship between social capital and the percentage of the population that finds opportunities for business creation, and they support the idea that social networks can facilitate the identification of opportunities and reduce the cost of the resources required to start a business initiative.

— **Risk aversion:** the relationship between the decision to start a new business and the risk aversion has also been analyzed in the literature. So, some studies state that reduction on failure perception increases the probability of new entrepreneurial initiatives (Weber and Milliman, 1997). The entrepreneurial behavior has been generally associated with moderate levels of individual's risk (McCelland, 1961; Sexton and Bowman, 1983). However, there have emerged certain contradictions, as those that explain the relationship between risk propensity and the decision to start a new business. Thus, some empirical studies confirm that entrepreneurs founding their own company have a risk propensity higher than CEOs of existing firms (Begley and Boyd, 1987), while other studies indicate that entrepreneurs do not have a risk propensity higher than other managers and the general population (Low and McMillan, 1988).

Based on these results, we state that risk aversion is one of the key factors to be considered to differentiate between entrepreneurs and non-entrepreneurs, so worthwhile to study how the individual processes the information coming from the environment and detects market opportunities. In this sense, Palich and Bagby (1995) found evidences that entrepreneurs perceive more positively than other individuals certain scenarios to develop a new business. So, entrepreneurs are more likely to see scenarios with market op-

portunities where others only see a low return in relation to risk associated. Those perceptions are confirmed based on the results of GEM for Spain. The data showing the fear of failure as an obstacle to start a new business differentiate between the population involved in the entrepreneurial process and those not involved, and indicate that for the first group (entrepreneurs), the fear of failure is not an obstacle to start a new business, as if it would be in the case of the group not involved in the entrepreneurial process. This difference also is being maintained over time, as it is shown in GEM reports (2010, 2011).

— **Macro-economic Context:** the studies based on an economic approach have looked into contextual factors, and show evidences that the decision to create a new business is also influenced by the environment in which it is taken (Chell and Baines, 2000).
Thurik *et al.* (2002) provide a detailed analysis of those contextual factors that influence the birth of an entrepreneurial initiative, arguing that technology, the level of economic development, culture and institutions influence the detection of market opportunities for the development of a new business. They add that the cultural and institutional factors influence the decision to start a new business because these variables have incidence on the skills, resources and preferences of individuals. Finally, these authors conclude that differences in economic development among countries, cultural and institutional differences, as well as those concerning the different technological development may explain the national differences in terms of level of entrepreneurial activity.

3. Metodology

In order to meet the objectives of this study, we have developed a preliminary analysis of the level of entrepreneurial activity in Spain during 2011. These data have allowed us a better understanding of the key factors (socio-demographic, perceptual or contextual) that influence the entrepreneurial process. We have based our study on the database provided by the survey of the Global Entrepreneurship Monitor (GEM) in 2011 for Spain. The GEM project considers as active entrepreneurs all adults between 18 and 64 who are currently involved in the process of setting up a business or company as owner-manager of a new business for more than three months, but not more than 42 months. This definition includes the self-employment option. GEM explores the role of entrepreneurship in national economic growth, unveiling detailed national features and characteristics associated with entrepreneurial activity.

This Project is based on a survey for the adult population (18-64), aimed to determine the entrepreneurial intentionality of the population of the countries and regions analyzed. We can distinguish the following stages in the entrepreneurial process:

Business Definition

The first stage of the entrepreneurial process is the business definition, which represents the jump from the entrepreneurial intention (potential entrepreneurship) to the entrepreneurial activity (nascent initiatives).

Business Birth (early-stage)

This stage of the entrepreneurial process permits to calculate the rate most commonly used in the GEM project, the level of the Total Entrepreneurial Activity (TEA), distinguishing between those initiatives that have not yet paid salaries (nascent), and those that are involved in the entrepreneurial process but not more than 42 months of age.

Business Consolidation

This last stage of the process is aimed to analyze the persistence of the entrepreneurial initiatives, encompassing those with over 42 months of activity. At this stage we also study the closing rate of new firms, as well as its causes.

Fieldwork of GEM Project 2011 survey was conducted between April and June 2011 on a sample of 27,000 citizens resident in Spain and aged between 18 and 64 years.

3.1. Variables Definition

Dependent Variables

The **potential entrepreneurship** is derived from the question *«Are you planning to set up a new business or company either alone or with others in the next three years, including any option of self-employment?»*. The answers are grouped between Yes (1) and No (0).

The **early-stage entrepreneurship** or business birth phase is measured by the rate TEA (Total Entrepreneurial Activity Index), which is a qualitative variable that takes values 1 and 0 depending on whether the individual has entrepreneurial attitudes or not.

Finally, in order to measure the **consolidated entrepreneurship** we used the qualitative variable which collects information about people who own or run a business with more than 42 months old. It takes the value 0 and 1 depending on whether or not the individual meets these characteristics.

Explanatory Variables

The variables used to analyze entrepreneurial attitudes, business birth and business consolidation include different aspects such as the socio-economic level of the individual, his perception of the environment, his stock of social capital and the variables that allow us to identify the regions. Following are the variables used:

In relation to the *socio-economic contex* of the entrepreneur, we collected variables such as gender, age, education, occupation and income level.

With regard to the *individual's perception of the environment,* we analyzed the perception of the market opportunities, the possession of entrepreneurial skills, knowledge or experience to start a business and the perception of the fear of failure.

We analyzed the third group of variables, related to social capital, using multiple proxies depending on availability of the GEM survey in this regard. Thus, we measured two of the three dimensions in which the social capital construct is usually divided and which correspond to the trust and social networks.As measure of the trust we considered that there is *entrepreneurship trust* if the individual answers yes to the question *«In your country, most people consider entrepreneurship as a desirable career choice»,* to analyze the degree of trust that exists in the development entrepreneurship. With regard with networks we selected the question that comes closest to the concept of social networks perceived by individuals who answer yes to the question *«Do you know personally someone who started a business in the past two years?».* We considered that the existence of entrepreneurs in the social networks of the individual can help to boost entrepreneurship.

We identified variables dummies for each one of the regions analyzed (all regions, excluding Ceuta and Melilla).

Table 1 shows all the variables used and their values:

Table 1. Description of Variables

Dependent Variables	
Potential entrepreneurship: *«Are you planning to set up a new business or company either alone or with others in the next three years, including any option of self-employment?»*	No (0), Yes (1)
Early-stage entrepreneurship (Business birth): population aged between 18 and 64 years who are involved in any entrepreneurial activity	No (0), Yes (1)
Consolidated entrepreneurship: Population aged between 18 and 64 years who own and run a company with 42 or more months of existence	No (0), Yes (1)
Explanatory Variables	
SOCIO-ECONOMIC VARIABLES	
Gender	Male (0), Female (1)

Table 1. *(continue)*

Explanatory Variables		
SOCIO-ECONOMIC VARIABLES		
Age		18-24 (0), 25-34 (1), 35-44 (2), 45-54 (3), 55-64 (4)
Education		Primary (1), secondary (1), higher education (3)
Job status		Part-time job (1), Retired, Disabled (2), Housework (3), Student (4), Unemployment, others (5), Self-employment(6)
Level of income		Lower than 10,000 € (0), 10,001 €-20,000 € (1), 20,001 €-30,000 € (2), 30,001 €-40,000 € (3), 40,001 €-60,000 € (4), 60,001 €-100,000 € (5), Above than 100,000 € (6)
PERCEPTION		
Market Opportunities: *«Will there be over the next six months good opportunities to start a new business in the area where you live?»*		No (0), Yes (1)
Skills *«Do you have the knowledge, skills and experience required for the implementation of a new business?»*		No (0), Yes (1)
Failure: *«In your case, would the fear of failure be an obstacle to set up a new business?»*		No (0), Yes (1)
SOCIAL CAPITAL		
Trust		
Entrepreneurship	*«In your country, most people consider entrepreneurship as a desirable career choice»*	No (0), Yes (1)
Networking		
Social networking	*«Do you know personally someone who started a business in the past two years?»*	No (0), Yes (1)
REGIONS		
Regions	Madrid (0), Andalusia (1), Aragón (2), Asturias (3), Islas Baleares (4), Canary Islands (5), Cantabria (6), Castilla y León (7), Castilla La Mancha (8), Catalonia (9), Valencia (10), Extremadura (11), Galizia (12), Murcia (13), Navarra (14), Vasque Country (15), La Rioja (16)	

4. Results

4.1. Statistical and econometric results

Before of presenting the results obtained from the econometric analysis, the descriptive statistics of dependent variables are shown in table 2.

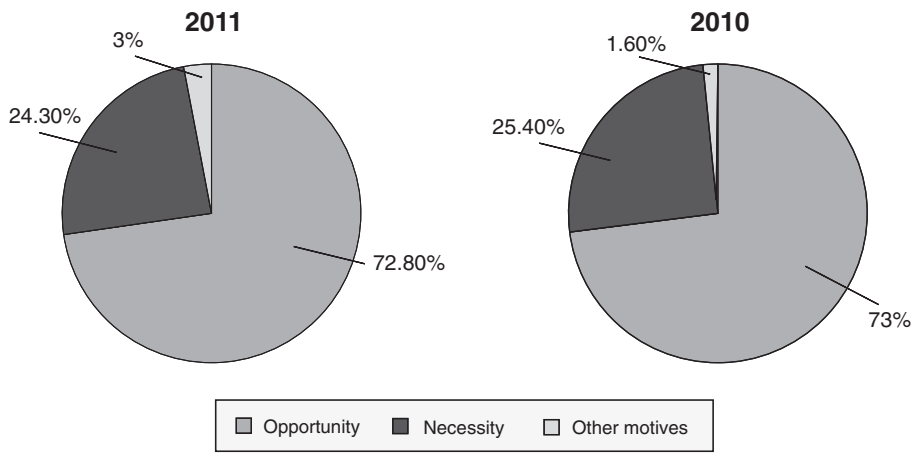
Table 2. Descriptive statistics of dependent variables

Dependent Variables		*Mean*	*Standard Deviation*	*Min.*	*Max.*
Potential Entrepreneurship	No (0)	0.905	0.293	0	1
	Yes (1)	0.095	0.293	0	1
Entrepreneurial Activity (early-stage)	No (0)	0.944	0.229	0	1
	Yes (1)	0.056	0.229	0	1
Consolidated Entrepreneurship	No (0)	0.904	0.294	0	1
	Yes (1)	0.096	0.294	0	1

According to these data, the 9.5% of respondents are potential entrepreneurs, 5.6% are fully involved in the entrepreneurial process and the 9.6% are consolidated entrepreneurs.

If we go into the analysis of the entrepreneurial activity, since the survey allows us to discern some reasons that individuals have to start a business, it is observed that a large majority of individuals do it if they perceive a market opportunity, while the entrepreneurship by necessity has changed little over the previous year.

Figure 1. Types of entrepreneurial motivations



The descriptive statistics used (Appendix I) show an overall negative perception of the economic context. Only 14.6% of respondents believe that in the next six months there will be market opportunities to set new companies. This data indicates that the entrepreneurs' perception of the economic context is quite negative, due to the current economic crisis. Even though more than a half believe to have knowledge and skills to start a business (50.8%), the fear of failure is present in a high percentage of them (50.7%).

As regard of the social capital variables, the 66.6% of individuals believe that entrepreneurship is a desirable activity, *i. e.* more than a half of respondents consider entrepreneurship as a good career option. With respect to the stock of social networks, only the 28.1% of individuals knew personally someone who had set up a business in recent years and, although this is not a very high percentage, it could act as a motivator on potential entrepreneurship.

The final aim of this study is to explain how variables related with perception and social capital (psychological approach) influence the decision to set up a new business. For this we have developed the following logistic regression with the variables specified above. This regression follows the logistic distribution function:

$$P_i = E\left(Y_i = \frac{1}{X_i}\right) = \frac{1}{1+e} - Z_i \qquad Z_i = \beta_0 + \beta_i \cdot X_i$$

In this type of models the probability interval ranges from 0 to 1 but Z_i ranges from $-\infty$ and ∞. Moreover, although the logit is linear with respect to X_i, the probabilities do not have to follow this behavior. Thus, the probability will be lower when X_i also becomes smaller. However, the probability will be higher when the value of X_i is bigger (Annex II).

The results show differences among the entrepreneurial variables analyzed. So, being a woman is a negative and significant factor for the stage of consolidated entrepreneurship, but it does have any effect on early-stage or potential entrepreneurship. In terms of age, it appears that older individuals have less probability of being involved in potential or early-stage entrepreneurship, while the effect is opposite in the case of the consolidated entrepreneurship. Have a secondary or higher education level is significant only in the case of the consolidated entrepreneurship and its effect is also slightly negative, on the basis of not having any studies. Working part time or not having any job is positive for the potential entrepreneurship stage, while having no effect on other stages of entrepreneurial process. Being a student is only significant in the early-stage entrepreneurial activity and the effect is negative. Being autonomous is positive and significant in the case of entrepreneurial activity and the stage of consolidated entrepreneurship. Regarding the level of income, there is a significant positive effect on the consolidated entrepreneurship, while its effect is negative and often insignificant in potential entrepreneurship and entrepreneurial activity.

Most entrepreneurs (potential or involved in entrepreneurial activity) are motivated by the market opportunities (as shown by the positive and significant value of

the opportunity variable) and all they believe having the skills to set up a new business. Fear of failure can stop potential entrepreneurship and entrepreneurial activity, but it has no effect on the consolidated entrepreneurship, *i. e.,* fears about the viability of the project can curb entrepreneurial initiatives. In this sense, it is important to take into account that the Spanish culture often punishes failure, unlike other cultures. Thus, the White Paper on Entrepreneurship in Spain (2011) states that «There is consensus that the culture of Spain does not support entrepreneurship. Although improved, it is still not enough, because of a lack of greater recognition, especially in areas such as social and scientific entrepreneurship. [...] Experts highlight progress in promoting the culture of SMEs, but not a more innovative entrepreneurial orientation. Moreover, in Spain it is believed that «someone» —Government, the Public Administration or community services— has to solve or respond to certain problems or situations, which reduces or eliminates the entrepreneur's role, which could well respond to such situations». It would necessary to minimize that fear of failure of potential entrepreneurial initiatives.

With regard to social capital, trust variable is important for potential entrepreneurship, and not significant in the other two types of entrepreneurship analyzed. The fact of meeting people who are entrepreneurs (social networking) is positive and significant for potential entrepreneurship and entrepreneurial activity, and not significant in the consolidated entrepreneurship. These results indicate the importance of having a good stock of social capital when starting entrepreneurial activities. The existence of a social network as support during the early-stage of entrepreneurial activity is important to carry out such activity. Examples of these social networks could be the so-called business incubators or entrepreneurial support networks, which exist in Spain. Thus, it would be necessary to promote the maintenance and development of these networks to strengthen entrepreneurship. Moreover, the trust on entrepreneurs, another variable of social capital, is important in potential entrepreneurship, that is, individuals overall believe that entrepreneurship is a good thing. It is therefore necessary to promote the idea of entrepreneurship as something attainable and design policies to support the survival of new projects. Such actions can be carried out through seminars, workshops or activities to inform about the resources (or social networks) that are available for entrepreneurs.

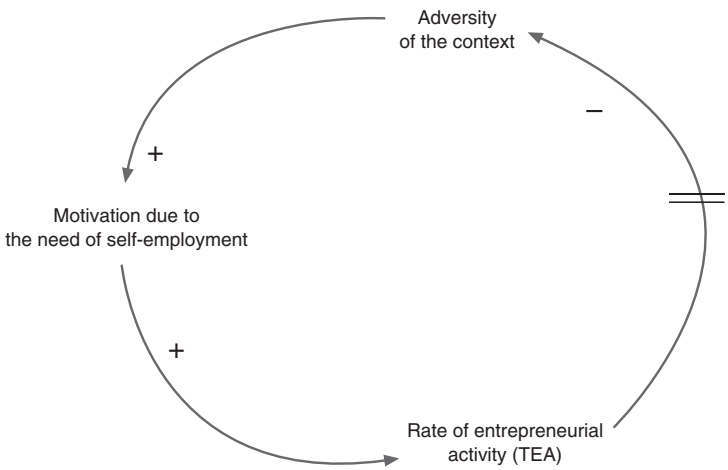
The results obtained in terms of regions are within expectations, taking as reference the Region of Madrid. So, there are negative values for potential entrepreneurship and entrepreneurial activity in almost every region, *i. e.,* there is less potential level of entrepreneurship in the region of reference, although few values are significant. Finally, the effects of the region for the consolidated entrepreneurship are the opposite. In the region of Madrid the degree of consolidation of companies is lower than in other regions, something that already pointed the descriptive statistics and now is confirmed by the econometric estimation. In order to analyze why this happens we would have to see what kind of entrepreneurial initiatives are those that are developed, if they are similar to those of other regions or not, etc., in order to assess the potential factors that condition this behavior, information that is not available today.

4.2. Dynamic behavior of the entrepreneurial attitude

Considering the results previously presented, we raised a number of causal diagrams, following the methodology of System Dynamics (Stearman, 2000), that allow us a better understanding of the relationship between psychological factors, sociological and economic context and the total entrepreneurial activity rate (TEA). In the diagrams presented below, and according to the System Dynamics methodology, the positive sign (+) of the arrows indicates a direct relationship between related variables, while the negative sign (–) shows an inverse relationship between them. The double stripe on the arrow (/ /) indicates a time delay in the relationship between the variables indicated.

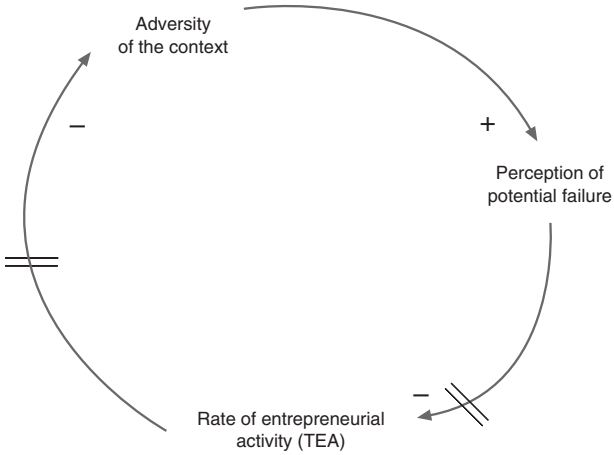
The first loop shows the relationship between the context, the entrepreneurial motivation and the TEA. The perception of a higher adversity of the context for entrepreneurship, measured through the individual's perception of a lesser market opportunities, increases the entrepreneurial motivation due to the need of self-employment (instead of the motivation due to the perception of market opportunities), and this motivation increases the rate of entrepreneurial activity (TEA). This situation, over time, will favour the capacity for being employed of these individuals, offering them new opportunities and reducing their perception of the adversity of context (figure 2).

Figure 2. Loop 1. Dynamic of entrepreneurial motivation



However, this dynamic needs to be completed with other variables. According to the previous analysis, the adversity of the context also increases the entrepreneur's perception of a potential failure, and this may affect the abandonment of entrepreneurs, thereby reducing the future rate of entrepreneurial activity (figure 3).

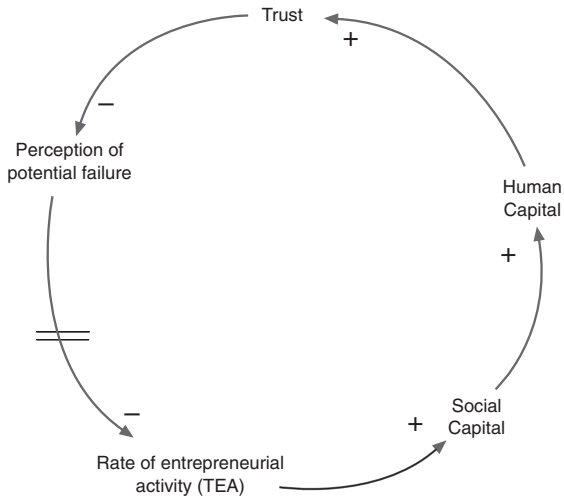
Figure 3. Loop 2. Dynamic effect of the failure perception



The dual effect of the context on entrepreneurial activity adds complexity to the problem, which leads us to analyze in a third loop how trust to possess knowledge and skills (human capital) or a social network of alliances (social capital) can affect the entrepreneurial activity.

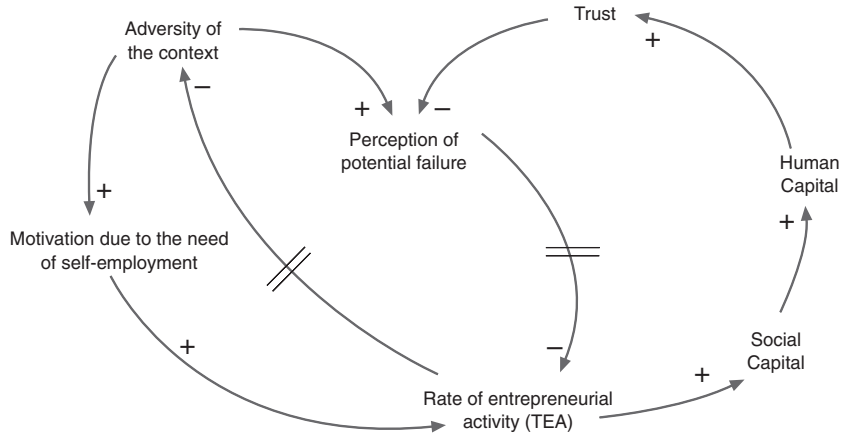
As we check previously in the empirical analysis, the capital increase strengthens the perception of entrepreneurs of owning enough knowledge and skills to start a business (human capital), which increases the confidence to create a new business, and it also reduces their perception of potential failure. The increase of theTEA results the increase in the number of new companies, and this increases the set of relationships among organizations (social capital) (figure 4).

Figure 4. Loop 3. Dynamic effect of trust in entrepreneurship



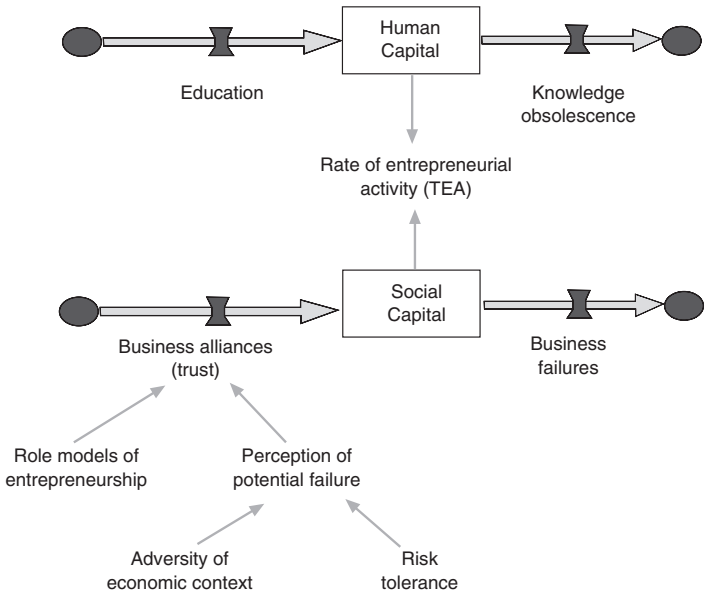
Finally, we present the global causal diagram explaining the relationship between the variables set as follows (figure 5).

Figure 5. Loop 4. Causal diagram of entrepreneurial willingness



From a dynamic approach, and considering the causal diagram above, we have designed a flow diagram (according to the systems dynamics methodology) that identifies how the stocks of human capital and social capital influence the rate of entrepreneurial activity (TEA). This will let us analyze the influence of the variables in the future (figure 6).

Figure 6. Entrepreneurial dynamic based on human and social capital



The model was designed in order to measure in the future the effect that greater investment in education could have on human capital accumulation available for the entrepreneur, taking into account that the obsolescence of this knowledge will reduce this stock. On the other hand, the existence of successful role models entrepreneurship as reference, and a lower perception of potential failure will increase alliances with other organizations, and this will increase the stock of social capital, which may be reduced, in turn, due to an increase of failures in those agreements.

Thus, this model allows to analyze the joint effect of the stock of human capital and social capital in the rate of entrepreneurial activity (TEA), supporting the decision process of government in guiding the stimulus measures in favour of entrepreneurship, final goal of this paper.

5. Conclusions

The aim of this study was presented as an analysis of the way of psychological factors influences the entrepreneurial decision. A logit model was estimated using data from the GEM project in 2011 for 16 Spanish regions. The model was proposed to analyze both potential entrepreneurship as entrepreneurial activity and the consolidated entrepreneurship, following the GEM methodology.

The main results obtained from the estimation of the model were the following:

— Social trust on entrepreneurs has proved to be important for potential entrepreneurship, so if the social perception of entrepreneurship as a career option is improved, it could favour the likelihood of an increase of potential entrepreneurs. However, it should be noted that this variable has not been significant on emerging entrepreneurial activity or the consolidated entrepreneurship, that is, once the entrepreneur has started the business, social trust ceases to have a relevant impact in the decision.

— Another of the variables used to analyze the influence of social capital has been whether the entrepreneur knows other entrepreneurs. In this case, the influence of this variable has shown as positive and significant in the case of potential entrepreneurship and nascent entrepreneurial activity. That is, the knowledge of other entrepreneurs increases the likelihood of creating new businesses within a period of three years since entrepreneur took the decision of set up a new company.

— Being a woman seems to adversely affect the consolidated entrepreneurship but however, it does not have a negative effect in the initial stages of the business creation (when the relationship between gender and entrepreneurship turns out to be not significant).

— As noted by other studies, it appears that the older are entrepreneurs, the lower is their potential and nascent entrepreneurial capacity but instead, an older age level enhances consolidated entrepreneurship.

— Other variables with positive effects on potential entrepreneurship are those related with the job status of the individual. Working part time or not working

(entrepreneurship motivation due to the need of self-employment), are also variables that have no effect on other types of entrepreneurship.

— Having a secondary or higher education level is significant only in the case of consolidated entrepreneurship and its effect is slightly negative. In this case, although numerous studies find a positive relation between education and entrepreneurship, they usually only consider specific training to set up a business.

— Other variables that have influence in the early stages of the entrepreneurial process (potential entrepreneurship and entrepreneurial activity) were the perception of market opportunities to run a new business, perception of having the skills (both positive and significant effect) or the fear of failure (negative influence).

From the dynamic approach proposed, we analyzed the interactions between psychological, sociological and entrepreneurial context factors and the rate of the entrepreneurial activity, and designed a causal analysis of the entrepreneurial dynamic. Thus, we obtained a better understanding of the following issues:

— The rate of entrepreneurial activity can be increased by reducing the adversity of the environment or increasing the entrepreneurial motivation due to the need of self-employment.

— In turn, adversity of the context may increase the perception of potential failure, which may increase the abandonment of business initiatives, and thereby reduce the rate of entrepreneurial activity.

— An increase of social capital reinforces the perception of entrepreneurs of having enough knowledge and skills to start a business, also increasing the trust (business alliances) and reducing the perception of potential failure. So, the increase of the rate of nascent entrepreneurship will also cause an increase in the number of new businesses, enhancing the set of relationships between organizations, or what is the same, its stock of social capital.

As final conclusion, the empirical results have enabled the development of a conceptual model that explains some entrepreneurial dynamics, despite being aware of the limitations that the lack of psychological data imposes to the time of delving into this model in more detail.

To sum up, this analysis allows us to make the following policy recommendations in order to support a positive entrepreneurial dynamic:

Recommendations:

The influence of variables related with social capital shows the importance of the social recognition of entrepreneurs to maintain a positive entrepreneurial dynamic, so it is very important the dissemination of best practices in local entrepreneurship, not only in the actions of dissemination of entrepreneurial culture but also to the overall society, and in this last case the media must play a key role. These actions are also important as tools to reduce the fear of failure, especially when entrepreneurs share the problems they had to face since the time of launching of the idea, and the solutions that were adopted in the process of business creation.

The existence of social networks is another variable that has shown a significant influence in the entrepreneurial decision. In this sense, the existence of incubators, and the organization of networking activities among entrepreneurs and events where entrepreneurs can share their projects are essential to create and consolidate networks where entrepreneurial activity can be increased and supported.

Finally, the positive influence of the variable perception of market opportunities in the entrepreneurial decision makes relevant to raise the development of a resource base to let potential entrepreneurs identify innovative ideas and potential market niches. Banks of projects, the brainstorming of new trends in innovation and the feasibility assessment of entrepreneurial ideas are key issues, from our point of view, to improve both the likelihood of potential entrepreneurship as the entrepreneurial activity.

The analysis of the Spanish entrepreneurial attitude in relation to the other countries involved in the project is discussed in GEM Report (2011:75), and it concludes that the variables fear of failure and perception of market opportunities has values for Spain very far from the countries of our natural context. And this is relevant, because both aspects are key issues through the entrepreneurial process. To sum up, the change of cultural preferences, so that the population be able to perceive the market opportunities, as it happens in countries with long experience in this field, and reduce the fear of failure, constitute two of the social values to support in order to achieve foster entrepreneurship in Spanish regions.

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Annexes

Anex I. Explanatory Variables Descriptive Statistics

Explanatory Variables		*Mean*	*Standard Deviation*	*Min.*	*Max.*
SOCIO-ECONOMIC					
Gender	Male (0)	0.506	0.500	0	1
	Female (1)	0.494	0.500	0	1
Age	18-24 (0)	0.101	0.301	0	1
	25-34 (1)	0.247	0.431	0	1
	35-44 (2)	0.259	0.438	0	1
	45-54 (3)	0.221	0.415	0	1
	55-64 (4)	0.173	0.378	0	1
Education Level	Primary (0)	0.359	0.480	0	1
	Secondary (1)	0.333	0.471	0	1
	Higher (2)	0.308	0.462	0	1
Job Status	Full-time job (0)	0.381	0.486	0	1
	Part-time job (1)	0.084	0.278	0	1
	Retired, disabled (2)	0.065	0.247	0	1
	Housework (3)	0.081	0.273	0	1
	Student (4)	0.074	0.262	0	1
	Unemployed, other (5)	0.165	0.372	0	1
	Self-employed(6)	0.149	0.356	0	1
Income level	Until 10,000 € (0)	0.168	0.374	0	1
	10,001 €-20,000 € (1)	0.309	0.462	0	1
	20,001 €-30,000 € (2)	0.239	0.426	0	1
	30,001 €-40,000 € (3)	0.132	0.339	0	1
	40,001 €-60,000 € (4)	0.099	0.299	0	1
	60,001 €-100,000 € (5)	0.040	0.196	0	1
	Above than 100,000 € (6)	0.013	0.111	0	1
PERCEPTION					
Opportunity	No (0)	0.854	0.353	0	1
	Yes (1)	0.146	0.353	0	1
Skills	No (0)	0.492	0.500	0	1
	Yes (1)	0.508	0.500	0	1

Anex I. (*continue)*

Explanatory Variables		*Mean*	*Standard Deviation*	*Min.*	*Max.*
PERCEPTION					
Failure	No (0)	0.493	0.500	0	1
	Yes (1)	0.507	0.500	0	1
SOCIAL CAPITAL					
Trust					
Entrepreneurship	No (0)	0.334	0.472	0	1
	Yes (1)	0.666	0.472	0	1
Networking					
Social networking	No (0)	0.719	0.450		
	Yes (1)	0.281	0.450	0	1
REGION					
Regions	Madrid (0)	0.114	0.318	0	1
	Andalusia (1)	0.029	0.167	0	1
	Aragón (2)	0.057	0.232	0	1
	Asturias (3)	0.011	0.106	0	1
	Balearic Islands (4)	0.011	0.106	0	1
	Canary Islands (5)	0.057	0.232	0	1
	Cantabria (6)	0.057	0.232	0	1
	Castilla y León (7)	0.011	0.106	0	1
	Castilla La Mancha (8)	0.011	0.106	0	1
	Catalonia (9)	0.114	0.318	0	1
	Valenciana (10)	0.114	0.318	0	1
	Extremadura (11)	0.057	0.232	0	1
	Galicia (12)	0.114	0.318	0	1
	Murcia (13)	0.057	0.232	0	1
	Navarra (14)	0.057	0.232	0	1
	Vasque Country (15)	0.114	0.318	0	1
	La Rioja (16)	0.011	0.106	0	1

Anex II. Estimation results

	Potential entrepreneurship	*Entrepreneurial Activity*	*Consolidated Entrepreneurship*
Woman (1)	–0.0116	–0.0007	–0.0098**
25-34 (1)	–0.0353**	–0.0377**	0.0125
35-44 (2)	–0.0432**	–0.0432***	0.0505***
45-54 (3)	–0.0734***	–0.0677***	0.0640***
55-64 (4)	–0.1141***	–0.0861***	0.0758***
Secondary education (1)	0.0033	0.0121**	–0.0084
Higher education (2)	–0.0017	0.0193***	–0.0131**
Part-time job (1)	0.0465***	0.0103	–0.0034
Retired, disabled (2)	–0.0643***	–0.0260***	–0.0090***
Housework (3)	–0.0236	–0.0119	–0.0116***
Student (4)	0.0200	–0.0178***	–0.0046
Unemployed, other (5)	0.0737***	0.0205***	–0.0055
Self-employed (6)	0.0030	0.1481***	0.4583***
10.001 €-20.000 € (1)	–0.0098	–0.0194**	0.0085
20.001 €-30.000 € (2)	–0.0210	–0.0168	0.0164**
30.001 €-40.000 € (3)	–0.0289**	–0.0280***	0.0260***
40.001 €-60.000 € (4)	0.0008	–0.0154	0.0254***
60.001 €-100.000 € (5)	0.0224	–0.0198	0.0313***
Above than 100.000 € (6)	0.0455	0.0243	0.0351**
Opportunity	0.0933***	0.0408***	0.0013
Skills	0.1029***	0.0537***	0.0365***
Failure	–0.0319***	–0.0217***	0.0059
Trust Entrepreneurship	0.0181***	–0.0052	–0.0032
Social networks	0.0583***	0.0456***	–0.0197
Andalucía (1)	–0.0376	–0.0205	0.0147
Aragón (2)	–0.0417**	–0.0333***	0.0286***
Asturias (3)	–0.0564	–0.0566***	0.0616***
Baleary Islands (4)	–0.0076	–0.0539***	0.0327
Canary Islands (5)	–0.0114	–0.0119	0.0037
Cantabria (6)	–0.0275	–0.0374***	0.0449***
Castilla y León (7)	–0.0479	0.0355	0.0526**
Castilla La Mancha (8)	0.0089	–0.0129	0.0512***
Catalonia (9)	–0.0271	–0.0080	0.0109
Valencia (10)	–0.0288**	–0.0199	0.0224**
Extremadura (11)	–0.0486***	–0.0269**	0.0363***

Anex II. (*continue)*

	Potential entrepreneurship	*Entrepreneurial Activity*	*Consolidated Entrepreneurship*
Galicia (12)	–0.0109	–0.0158	0.0224**
Murcia (13)	0.0073	0.0128	0.0178
Navarra (14)	–0.0177	–0.0078	0.0299**
Vasque Country (15)	–0.0366**	–0.0393***	0.0284***
La Rioja (16)	–0.0872***	–0.0670***	–0.0187
N	8.536	8.728	8.728
Pseudo-R2	0,1395	0,2490	0,5783

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Section ARTICLES

Investigaciones Regionales

Aplicación de la teoría de la acción razonada al ámbito emprendedor en un contexto universitario

Inés Rueda Sampedro **; Ana Fernández-Laviada *; Ángel Herrero Crespo *

RESUMEN: Este trabajo analiza el efecto de las ventajas e inconvenientes percibidos en el emprendimiento sobre la intención de crear un negocio propio, tomando como referencia la Teoría de Acción Razonada. La muestra está compuesta por 274 estudiantes de la Facultad de Ciencias Económicas y Empresariales de la Universidad de Cantabria. Para contrastar las hipótesis de investigación se emplea un enfoque de ecuaciones estructurales. Los resultados obtenidos ponen de manifiesto que las ventajas del emprendimiento influyen en la actitud del universitario, y ésta, a su vez, en su intención emprendedora. Por el contrario, los inconvenientes asociados al emprendimiento no tienen un efecto significativo.

Clasificación JEL: L26.

Palabras clave: Teoría de Acción Razonada; intención emprendedora; estudiantes universitarios; ventajas e inconvenientes del emprendimiento.

Applying the Theory of Reasoned Action to Entrepreneurship within a University Setting

ABSTRACT: This paper analyses the effect of the perceived advantages and disadvantages of entrepreneurship surrounding the starting of a new business and it is based on the Theory of Reasoned Action. The sample contains 274 students of the Faculty of Business and Economics (University of Cantabria). A structural equation approach is used to test the research hypotheses. The results obtained show that the entrepreneurship advantages influence a college student's attitude and later have an impact on their entrepreneurial intentions. However, the disadvantages associated with entrepreneurship have no significant effect.

JEL Classification: L26.

Keywords: Theory of Reasoned Action; entrepreneurial intentions; college students; advantages and disadvantages of entrepreneurship.

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1. Introducción

En la actualidad existe un creciente interés hacia el estudio de las intenciones emprendedoras de los estudiantes universitarios (Álvarez *et al.*, 2006; Guerrero y Urbano, 2007; Wilson *et al.*, 2007; Wu y Wu, 2008; Gupta *et al.*, 2009; Liñán *et al.*, 2011). Investigadores y profesionales consideran que las intenciones juegan un papel muy importante en el proceso de decisión de creación de una empresa (Liñán y Chen, 2009), de ahí que el interés por saber más sobre este ámbito esté aumentando significativamente en los últimos tiempos. A pesar de los numerosos estudios que actualmente se vienen realizando sobre las intenciones emprendedoras este campo aún se encuentra en una fase inicial de estudio.

La importancia de la actividad emprendedora en la economía y sociedad actuales es un hecho totalmente aceptado debido al desarrollo económico y social que supone para las regiones (Wennekers y Thurik, 1999; Minniti, *et al.*, 2005; Contin y Larraza, 2006; Larraza *et al.*, 2007). Este creciente interés hacia el estudio de las relaciones entre la actividad emprendedora y el desarrollo económico se debe a que se ve a la creación de empresas como un modo de solucionar los problemas de desempleo (Birch, 1979; Birley, 1987; White y Reynolds, 1996), de crecimiento económico y como fomento de la innovación y la competitividad de las regiones (Schumpeter, 1963; Drucker, 1986; Acs y Audretsch, 1988).

Por todo ello resulta especialmente interesante investigar todos aquellos factores que pueden influir en la intención de emprender de los individuos. Conociendo en profundidad todos los elementos implicados en el proceso de creación de una empresa se podría fomentar el espíritu emprendedor de una manera eficaz con el fin de promover la creación de nuevas empresas y por ende el crecimiento de los países.

El presente trabajo estudia la influencia de las ventajas e inconvenientes que puede percibir un estudiante universitario en el momento de crear su propia empresa sobre su intención de emprendimiento. De este modo, en consonancia con los modelos de comportamiento individual basados en la secuencia creencias-actitudes-intenciones (Shapero y Sokol, 1982; Bird, 1988; Robinson *et al.*, 1991; Krueger y Brazeal, 1994; Davidsson, 1995; Krueger *et al.*, 2000; Guerrero, Rialp y Urbano, 2008; Carsrud *et al.*, 2009), se considera que el comportamiento emprendedor está determinado por las creencias respecto a la creación de un negocio propio, tanto positivas (ventajas) como negativas (inconvenientes). En consecuencia, tomando como marco de referencia la Teoría de Acción Razonada (Ajzen y Fishbein, 1980), se propone un modelo que incorpora la influencia de las ventajas e inconvenientes del emprendimiento. La elección de este marco teórico se justifica por dos aspectos fundamentalmente: 1) estamos ante una teoría muy completa, bien elaborada y suficientemente probada científicamente, y 2) las variables que incorpora el modelo (actitudes y norma subjetiva) permiten una gran explicación de la intención.

El modelo de emprendimiento propuesto se aplica en el ámbito específico de los estudiantes universitarios, por lo que se encuadra dentro de la línea de investigación

en «emprendimiento educativo», un campo de estudio insuficientemente explorado (Liñán, 2004; Guzmán y Liñán, 2005; Toledano, 2006). Este hecho constituye una de las aportaciones más relevantes de la investigación, ya que el colectivo de estudiantes resulta de gran interés en el ámbito del emprendimiento, al encontrarse en una etapa previa a la incorporación al mercado laboral, en la que deben optar entre buscar trabajo por cuenta ajena o por la creación de un negocio propio (Liñán, 2004; Guzmán y Liñán, 2005; Martín, Hernangómez y Rodríguez Escudero, 2005; Toledano 2006; Espíritu y Sastre, 2007, Espíritu y Sastre, 2008). El sistema educativo constituye, por tanto, un vivero fundamental de emprendedores, especialmente en un momento de crisis como el actual, en el que el auto-empleo es una alternativa cada vez más valorada y la creación de nuevos negocios se contempla como una vía básica para superar las dificultades económicas del país.

Este trabajo aporta, por tanto, dos contribuciones fundamentales a la literatura sobre emprendimiento: 1) profundiza en la comprensión de la influencia que tienen en la decisión de emprendimiento las percepciones de los individuos respecto a las ventajas e inconvenientes de crear un negocio propio, y 2) se examina un colectivo de especial relevancia en el ámbito del emprendimiento, como son los estudiantes universitarios, que se encuentran en situación de encaminar su futuro profesional y, por tanto, en un momento crítico para la decisión de crear una empresa propia.

El trabajo está dividido en cinco apartados. Una vez realizada una breve introducción se expone la teoría de comportamiento aplicada y se proponen las correspondientes hipótesis, que dan lugar a un modelo de comportamiento emprendedor para estudiantes universitarios. Posteriormente se describe la metodología utilizada en el estudio para a continuación presentar los principales resultados obtenidos. Para finalizar, el último de los apartados recoge las conclusiones más importantes de la investigación.

2. Teoría e hipótesis

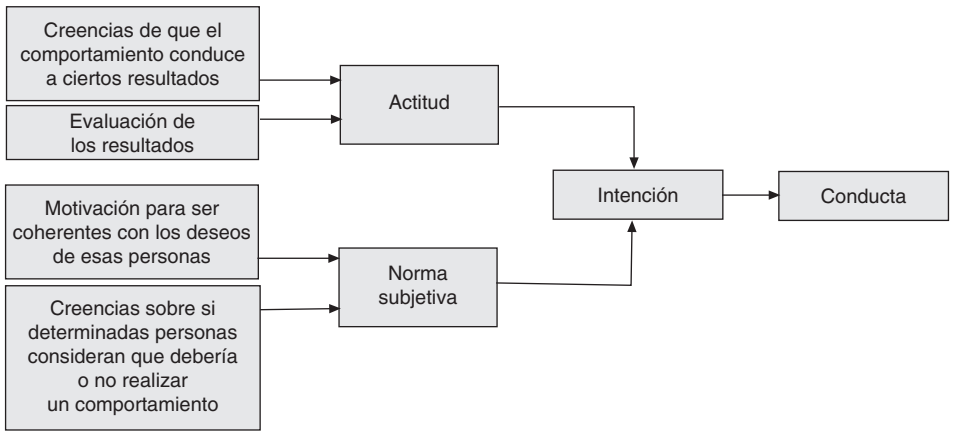
El presente epígrafe pretende realizar una breve descripción de la Teoría de Acción Razonada (Ajzen y Fishbein, 1980), principal modelo de comportamiento tomado como referencia en este trabajo. Asimismo se estudian algunas investigaciones llevadas a cabo dentro del ámbito del emprendimiento y sustentadas en este marco teórico. Posteriormente, se analizan las ventajas e inconvenientes percibidos en el emprendimiento y su influencia en la intención emprendedora. A su vez se van planteando cada una de las hipótesis de nuestro trabajo de investigación.

2.1. Teoría de Acción Razonada

La Teoría de Acción Razonada (Theory of Reasoned Action o TRA) constituye un modelo seminal de gran relevancia dentro de la literatura sobre comportamiento individual, de acuerdo con el cual la conducta de los sujetos (*e. g.* emprendedores)

se explica sobre la base de la relación creencias-actitud-intención-comportamiento. En particular, la Teoría de Acción Razonada (Ajzen y Fishbein, 1980) considera a la intención de comportamiento como el mejor indicador o previsor de la conducta, y contempla dos tipos de variables determinantes o explicativas de la intención de comportamiento: la actitud hacia el comportamiento y la norma subjetiva del individuo (figura 1). De este modo, las creencias respecto a la conducta a desarrollar preceden a la actitud y las creencias normativas preceden a las normas subjetivas; a su vez, las actitudes y las normas subjetivas preceden a la intención y ésta al comportamiento real (Ajzen, 1991).

Figura 1. Teoría de la Acción Razonada



Fuente: adaptado de Ajzen y Fishbein (1980)

La *actitud hacia el comportamiento* hace referencia a la predisposición, favorable o desfavorable, hacia el desarrollo de una conducta determinada y es resultado de las creencias que tiene el individuo en relación al comportamiento y la evaluación que éste hace de dicha creencia (Fishbein y Ajzen, 1975). La *norma subjetiva* es el resultado de los sentimientos que tiene el individuo de la opinión que otras personas —familia, amigos, compañeros de trabajo, entre otros— tienen sobre su comportamiento (Fishbein y Ajzen, 1973; Schofield, 1974). La norma subjetiva se deriva de dos factores subyacentes básicos: las creencias normativas que el individuo atribuye a sus personas de referencia y la motivación para comportarse de acuerdo con los deseos de estas personas.

De acuerdo con los postulados de la Teoría de Acción Razonada, el antecedente directo del comportamiento emprendedor (*e. g.* creación de una empresa propia) será su intención o propósito de desarrollar dicha conducta en el futuro. Por su parte, la intención de emprendimiento estará influida en primer lugar por la actitud hacia el emprendimiento, es decir, por la predisposición global del individuo hacia la creación de su propio negocio y de las consecuencias asociadas a dicha conducta. De este

modo, en la medida en que el sujeto considere que crear una empresa es algo positivo en términos generales, su intención de emprendimiento será mayor. Por otra parte, el propósito de crear un negocio propio estará también influido por la presión social percibida por los individuos respecto a dicha conducta. Es decir, la intención de emprendimiento será mayor cuando los sujetos perciben que su entorno social respalda, o al menos no rechaza, dicho comportamiento.

La Teoría de Acción Razonada ha sido aplicada y validada en diversas investigaciones dentro del campo del emprendimiento, respaldándose con carácter general su validez para explicar el comportamiento emprendedor en diversos contextos. De este modo, en el ámbito específico de la educación universitaria Gargallo *et al.* (2007) y Gasse y Tremblay (2011) obtienen evidencia empírica que respalda la influencia de la actitud hacia el emprendimiento y la norma subjetiva sobre la intención de crear un negocio propio. Así mismo, Cegarra *et al.* (2010) respaldan la validez de la TRA para explicar el comportamiento emprendedor en el contexto de las PYMEs.

Con diferentes enfoques teóricos, diversos autores han confirmado el efecto de las actitudes hacia el emprendimiento sobre la intención de crear un negocio propio (Krueger *et al.*, 2000; Liñán y Chen, 2009; Campos y Azanza, 2011; Finisterra do Paço *et al.*, 2011; Gallurt, 2010). En particular, Krueger *et al.* (2000), Liñan y Chen (2009) y Campos y Azanza (2011), contrastan la influencia de la actitud de los estudiantes universitarios respecto al emprendimiento sobre la intención de crear una empresa en el futuro. Finisterra do Paço *et al.* (2011) obtienen resultados similares en estudiantes de educación secundaria. Finalmente, la evidencia empírica obtenida por Gallurt (2010) respalda la influencia de las actitudes hacia el emprendimiento en la intención de creación de *«spin-off»* en las universidades españolas. En consonancia con la evidencia obtenida en estos trabajos y con los planteamientos de la TRA se propone la siguiente hipótesis de investigación:

H1: *La actitud del individuo hacia el emprendimiento influye positivamente en la intención de emprender.*

En la misma línea, la influencia de la norma social respecto al emprendimiento en la intención de crear una nueva empresa ha sido confirmada por diversos trabajos previos sobre emprendimiento educativo. En particular, Benavides y Sánchez (2004) y Campos y Azanza (2011) constatan que la intención de emprendimiento de los estudiantes universitarios está determinada por la norma subjetiva percibida. Por su parte, Gallurt (2010) obtiene resultados similares en el contexto de la creación de *«spin-off»* en las universidades españolas. Por tanto, y tomando en consideración los planteamientos de la TRA, se propone la siguiente hipótesis de investigación:

H2: *La norma subjetiva influye positivamente en la intención de emprender.*

Por otra parte, aunque la TRA no considera un efecto directo de la norma subjetiva sobre la actitud hacia el comportamiento, diversas investigaciones han constatado esta relación causal. De acuerdo con esta evidencia, las creencias de los individuos respecto a lo que terceros relevantes opinan de su comportamiento no sólo influye sobre la intención de comportamiento futuro sino que también es interiorizada por

el sujeto condicionando sus actitudes (Gatignon y Robertson, 1985; Malhotra y Galletta, 1999; Pedersen y Nysveen, 2002). En el ámbito concreto del emprendimiento varios autores observan un efecto directo de la norma subjetiva sobre la actitud emprendedora de los sujetos (Liñán y Chen, 2009; Espíritu, 2011; Finisterra *et al.*, 2011). En consecuencia, se plantea la siguiente hipótesis de investigación:

H3: *La norma subjetiva influye positivamente en la actitud del individuo hacia el emprendimiento.*

2.2. Efectos de las ventajas e inconvenientes del emprendimiento en la actitud

De acuerdo con los modelos de intenciones, y en particular con la Teoría de Acción Razonada, la actitud de los individuos hacia el emprendimiento estará determinada por sus creencias respecto a dicho comportamiento. Por tanto, la actitud hacia el emprendimiento será favorable o desfavorable dependiendo de las creencias positivas y negativas del individuo hacia la creación de un negocio propio. Es decir, la decisión de emprendimiento dependerá de las ventajas e inconvenientes que se perciban en dicha conducta.

En consonancia con este planteamiento, diversos autores han observado que los emprendedores asocian a la creación de un negocio propio ventajas como la independencia o las recompensas económicas (Krueger, 2000; Moriano *et al.*, 2001; Leiva, 2004; Liñán y Rodríguez, 2005). En particular, con una perspectiva motivacional, orientada a examinar los factores que impulsan o frenan la decisión de emprendimiento, Urbano (2006) y Fuentes y Sánchez (2010) observan que la independencia personal y la posibilidad de poner en práctica las propias ideas son los motivos más significativos que influyen en la intención emprendedora. Es decir, la creencia de que crear un negocio propio facilita una mayor independencia personal y permite desarrollar las ideas propias es un aspecto motivador del comportamiento emprendedor. Por tanto, en términos de la Teoría de Acción Razonada, las creencias de los decisores respecto a la creación de una empresa propia tienen un efecto directo sobre la actitud y, por tanto, actúan como motivadores en la decisión de emprendimiento. De acuerdo con esta evidencia, se propone la siguiente hipótesis de investigación:

H4: *Las ventajas percibidas en el emprendimiento influyen de forma positiva en la actitud del individuo hacia el emprendimiento.*

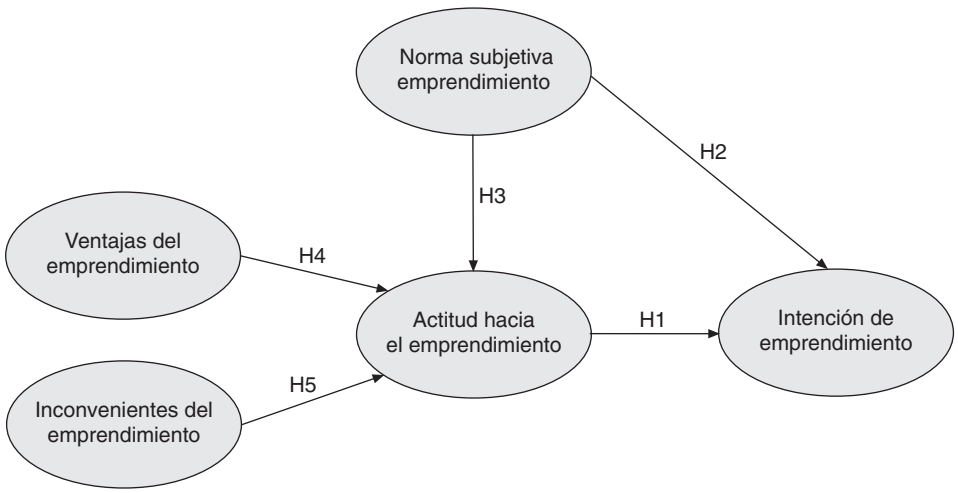
De forma análoga, distintos estudios han puesto de manifiesto que la decisión de emprendimiento se ve también condicionada por creencias negativas respecto a la creación de una empresa propia como son las necesidades de capital inicial y el riesgo económico (Kouriloff, 2000; Cano *et al.*, 2004; Liñán y Rodríguez, 2005; Urbano, 2006; Fuentes y Sánchez, 2010). Con un enfoque motivacional, Urbano (2006) y Fuentes y Sánchez (2010) observan que el riesgo o las necesidades financieras de capital inicial son las principales dificultades que percibe el emprendedor. Por tanto, las creencias negativas de los individuos respecto a la creación de un negocio propio,

actúan como frenos al comportamiento emprendedor. De acuerdo con la Teoría de Acción Razonada, este efecto desmotivador se producirá a través de la influencia que las creencias del individuo respecto a la creación de un negocio propio tienen sobre la actitud hacia el emprendimiento. En consonancia, se propone la siguiente hipótesis de investigación:

H5: *Los inconvenientes percibidos en el emprendimiento influyen de forma negativa en la actitud del individuo hacia el emprendimiento.*

Todas las hipótesis de investigación planteadas dan como resultado un modelo integral de intención de emprendimiento que se recoge en la figura 2.

Figura 2. Modelo de Investigación



3. Metodología de investigación

Con el fin de contrastar empíricamente las hipótesis planteadas se llevó a cabo una investigación de naturaleza cuantitativa mediante la que se exploraron los mecanismos psicológicos que podrían guiar las intenciones de emprendimiento de los estudiantes universitarios.

3.1. Desarrollo de las medidas

La recogida de la información se realizó mediante un cuestionario en el que las variables del modelo teórico se midieron a través de escalas multi-ítem (apéndice A). Esto permite obtener valoraciones de variables psicológicas que no son directamente observables o para las que no se puede asignar una cuantificación directa (Churchill

y Iacobucci, 2002). Las valoraciones se capturaron a través de escalas Likert de cinco posiciones, donde 1 significa desacuerdo total con la afirmación planteada y 5 acuerdo total. Para la medición de la intención de emprender y de las variables incluidas en la formulación de la Teoría de Acción Razonada original (actitud hacia el emprendimiento y norma subjetiva) se desarrollaron a partir de los trabajos de Guerrero y Urbano (2007) y Liñán y Chen (2009). Respecto a las escalas de medida para las ventajas e inconvenientes del emprendimiento se diseñaron a partir de los trabajos de Urbano (2006), Krueger (2000) y Kouriloff (2000). En particular, al objeto de identificar un conjunto lo más exhaustivo posible de ventajas e inconvenientes relevantes en la decisión de emprendimiento se han tomado como referencia las aportaciones de Kouriloff (2000) y Krueger (2000). Concretamente, el primero analiza las barreras, frenos o inconvenientes que se pueden encontrar en el entorno empresarial, mientras que el segundo aborda todos aquellos factores relacionados con las oportunidades y ventajas del emprendimiento.

3.2. Diseño del muestreo

La encuesta se dirigió a estudiantes de primer y último curso de las carreras ofertadas en la Facultad de Ciencias Económicas y Empresariales de la Universidad de Cantabria. La muestra fue seleccionada a través de la combinación de dos métodos no probabilísticos: por cuotas y de conveniencia. Los alumnos respondieron al cuestionario en el aula, de forma anónima, durante quince minutos, entre los meses de abril y mayo de 2011 (curso académico 2010-2011). El número total de encuestas válidas obtenidas fue de 274 y el perfil socio-demográfico de la muestra es el que se detalla en la tabla 1.

Tabla 1. Perfil socio-demográfico de la muestra

Variable	*%*	*Variable*	*%*
Sexo		Estudios Universitarios	
Hombre	46,7	Economía	24,5
Mujer	53,3	Administración de Empresas	75,5
Edad		Curso	
18-24 años	94,7	Primero	67,2
25 o más años	5,3	Último	32,8

4. Resultados

El análisis de resultados se basa en una metodología de ecuaciones estructurales (SEM), desarrollada en tres etapas. En primer lugar se evalúan las propiedades psicométricas de las escalas de medición (fiabilidad y validez), realizando un análisis factorial confirmatorio (AFC) con el programa EQS 6.1. A continuación, se estima el modelo causal para la muestra global con el fin de contrastar las hipótesis H1 a H5.

4.1. Análisis factorial confirmatorio y estimación del modelo estructural

En primer lugar se realiza un análisis factorial confirmatorio con el programa EQS 6.1 al objeto de evaluar la fiabilidad y la validez de las escalas de medición empleadas en esta investigación (tabla 2). Los resultados del proceso de validación de las escalas indican un correcto planteamiento de la estructura factorial, ya que los estadísticos BBNNFI, IFI y CFI toman valores muy próximos al nivel mínimo recomendado de 0,9 y el estadístico RMSA presenta un valor inferior a 0,08 [1]. Además, se obtienen elevados niveles de fiabilidad —coeficientes alpha de Cronbach y de Fiabilidad Compuesta superiores a 0,7 y coeficientes AVE superiores o muy próximos a 0,5 (Bagozzi y Yi, 1988)—, validez convergente —coeficientes estandarizados signi-

Tabla 2. Análisis factorial confirmatorio de las variables del modelo

Variable latente	*Variable medida*	*Lambda estand.*	R^2	α *Cronbach*	*Fiabilidad compuesta*	*AVE*	*Bondad ajuste*
Intención de emprendimiento	INT1	0,86	0,73	0,78	0,834	0,628	χ^2 Normalizado = 2,4 BBNNFI = 0,82 CFI = 0,85 IFI = 0,85 RMSEA = 0,07
	INT2	0,80	0,64				
	INT3	0,71	0,50				
Actitud hacia el emprendimiento	ACT1	0,84	0,71	0,73	0,810	0,590	
	ACT2	0,64	0,40				
	ACT3	0,81	0,65				
Norma Subjetiva	SN1	0,84	0,70	0,76	0,847	0,651	
	SN2	0,70	0,49				
	SN3	0,87	0,76				
Ventajas del emprendimiento	VEN1	0,87	0,75	0,79	0,876	0,587	
	VEN2	0,76	0,57				
	VEN3	0,70	0,49				
	VEN4	0,74	0,54				
	VEN5	0,75	0,57				
Inconvenientes del emprendimiento	INC1	0,82	0,68	0,69	0,774	0,414	
	INC2	0,60	0,36				
	INC3	0,51	0,26				
	INC4	0,69	0,47				
	INC5	0,55	0,30				

[1] En la validación de los modelos de ecuaciones estructurales se usan principalmente tres tipos de medida de la calidad del ajuste: medidas de ajuste absoluto, medidas de ajuste incremental y medidas de ajuste de parsimonia (Hair *et al.*, 1998). En este trabajo se utilizan las estadísticas que ofrece EQS 6.1, ampliamente utilizado en la literatura SEM (Byrne, 1994): BBNNFI y RMSEA como medidas del ajuste global del modelo, IFI y CFI como medida del ajuste incremental y χ^2 normalizado como medida de la parsimonia del modelo.

ficativos y superiores a 0,5 (Steenkamp y Van Trijp, 1991)— y validez discriminante —los intervalos de confianza para las correlaciones entre pares de factores latentes no incluyen la unidad (Anderson y Gerbing, 1988)—. De este modo, puede afirmarse que las escalas son fiables y válidas para medir las variables del modelo.

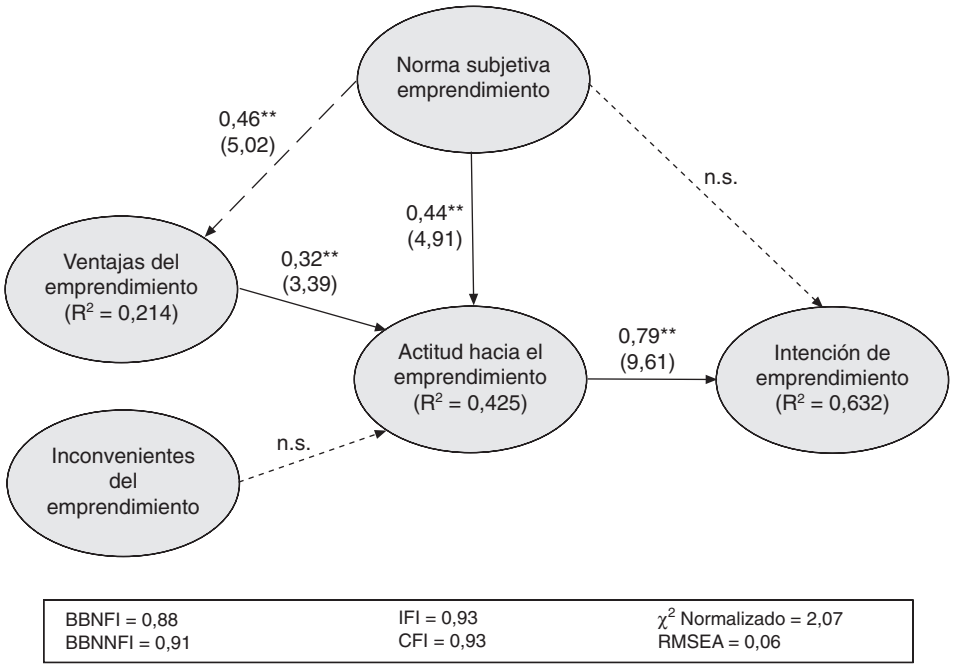
Una vez examinadas las propiedades psicométricas de las escalas, se estima el modelo causal propuesto mediante el procedimiento de Máxima Verosimilitud Robusto. Una estimación inicial del modelo estructural indica que la norma subjetiva no influye significativamente en la intención de emprendimiento y que los inconvenientes percibidos en el emprendimiento no tienen un efecto significativo sobre la actitud hacia dicho comportamiento. Se rechazan, por tanto, las hipótesis H2 y H5. Así mismo, el estadístico LM Test sugiere la introducción de una relación causal no considerada en el modelo inicial: el efecto de la norma subjetiva sobre las ventajas percibidas en el emprendimiento. Este resultado parece indicar la existencia de un proceso de influencia social que incorpora no sólo aspectos normativos sino también informativos. De este modo, y en consonancia con la teoría general de influencia social (Kelman, 1961, 1974; Vandenberg, Self y Seo, 1994), las opiniones de terceras personas influyen en las creencias de los sujetos respecto a un comportamiento, en este caso respecto al emprendimiento. Es decir, cuando los individuos perciben que su entorno social aprueba el comportamiento emprendedor, no sólo se refuerza su tendencia a desarrollar dicha conducta (efecto normativa recogido en esta investigación a través de la influencia de la norma subjetiva sobre la variable intención), sino que también modifican sus creencias sobre el comportamiento de forma positiva. Por tanto, las percepciones de los sujetos respecto a las ventajas del emprendimiento serán más positivas si sienten que su entorno aprueba dicho comportamiento.

En consecuencia, y siguiendo la estrategia de desarrollo del modelo (Hair *et al.*, 1998), se realiza una re-especificación del modelo eliminando el efecto directo de la norma subjetiva sobre la intención de emprendimiento e incluyendo la relación causal entre norma subjetiva y las ventajas percibidas en el emprendimiento. Los índices de bondad de ajuste para el modelo re-especificado están dentro de los niveles recomendados, confirmando su adecuado ajuste a los datos (figura 3). En relación con los determinantes de la intención de emprendimiento, los resultados demuestran que la actitud hacia el emprendimiento influye directamente en la intención de emprendimiento. En este sentido, resulta destacable el elevado nivel de explicación de la intención de comportamiento emprendedor, ya que la actitud explica más del 60% de la variabilidad de la variable dependiente ($R2 = 0,632$).

Además, se observa que la norma subjetiva y las ventajas percibidas en el emprendimiento influyen positivamente en la actitud hacia dicho comportamiento, mientras que los inconvenientes no presentan una relación significativa con la actitud. Por tanto, no se rechazan las H1, H3 y H4 de este trabajo.

Finalmente, desde una perspectiva conceptual, resulta también de interés examinar cuáles son las más relevantes asociadas al emprendimiento por parte de los estudiantes. En este sentido, se observa que todas las dimensiones de ventajas de

Figura 3. Estimación del modelo causal



* p-valor < 0,05

emprendimiento consideradas en el estudio tienen una contribución (carga estandarizada) similar al constructo global (recompensas económicas = 0,71; independencia/autonomía = 0,66; recompensas personales = 0,61; seguridad familiar y personal = 0,66; invertir y conseguir un patrimonio personal = 0,67).

5. Conclusiones e implicaciones

En el presente trabajo se ha analizado, con la Teoría de Acción Razonada como marco teórico de referencia, la influencia que tienen las ventajas e inconvenientes percibidos en el emprendimiento en la intención de los estudiantes universitarios de crear su propio negocio. Para estudiar dicha relación se propone un modelo extendido de comportamiento que se contrasta sobre una muestra de 274 estudiantes de la Facultad de Ciencias Económicas y Empresariales de la Universidad de Cantabria. Por tanto, la investigación desarrollada aporta dos contribuciones fundamentales respecto a la literatura previa: 1) examina la influencia de las ventajas e inconvenientes que los individuos asocian a la creación de una empresa propia en la intención de emprendimiento, incorporando dichas variables en un modelo de comportamiento global, y 2) investiga el comportamiento emprendedor de los estudiantes universitarios, un colectivo de especial relevancia en este ámbito, dado que se encuentra en una fase

previa a la incorporación al mercado laboral, y en la que debe decidir si optará por crear su propia empresa o por trabajar por cuenta ajena.

Por lo que se refiere a las relaciones causales planteadas por la Teoría de Acción Razonada, la evidencia empírica obtenida confirma que la intención de emprender está influida de forma directa y positiva por la actitud hacia el emprendimiento. Por el contrario, no se constata un efecto directo significativo de la norma subjetiva sobre la intención de emprender. Sin embargo, los resultados de la investigación ponen de manifiesto que la norma subjetiva influye de forma positiva en la actitud hacia el emprendimiento y en las ventajas percibidas en la creación de un negocio propio. Por tanto, se detecta una relación causal no considerada inicialmente en el modelo propuesto: la influencia de la norma subjetiva en la percepción de ventajas en el emprendimiento. Este resultado constituye una contribución relevante de la investigación ya que se pone de manifiesto que la influencia social de carácter normativo afecta a la intención de emprender de los estudiantes, pero de forma indirecta a través de su efecto en las creencias y de forma directa en las actitudes hacia el emprendimiento. Es decir, en la medida que los estudiantes perciban que su entorno social aprueba el comportamiento emprendedor su tendencia a desarrollar dicho comportamiento se reforzará y sus creencias sobre ese comportamiento emprendedor se verán modificadas positivamente.

Con respecto a la influencia de las creencias positivas (ventajas) y negativas (inconvenientes) respecto al emprendimiento, se observa que únicamente las primeras tienen un efecto significativo en la actitud hacia la creación de una empresa propia. En particular, todas las ventajas del emprendimiento consideradas contribuyen prácticamente en la misma medida, destacando ligeramente las recompensas económicas. Por el contrario, no se observa un efecto significativo de los inconvenientes percibidos en el emprendimiento y la actitud hacia dicho comportamiento. Esto puede ser debido a la distancia temporal hasta el momento en el que los estudiantes deben tomar la decisión efectiva de emprendimiento. En particular, ante un comportamiento no inminente, para los estudiantes pueden ser más evidentes los aspectos positivos asociados al emprendimiento, reforzados además por el contexto social (norma subjetiva), mientras que los inconvenientes para desarrollar dicha conducta resultan más difusos y, por tanto, no influyen significativamente en la conformación de la actitud hacia el emprendimiento. Así mismo, la situación de crisis en la que está inmersa la economía española, y que afecta especialmente al empleo juvenil, puede justificar también la ausencia de un efecto directo de los inconvenientes percibidos por los estudiantes en el emprendimiento y la actitud hacia la creación de una empresa propia. De este modo, ante la dificultad para encontrar un empleo por cuenta ajena, las ventajas asociadas al emprendimiento parecen tener un peso crítico en la conformación de la actitud hacia dicha conducta, mientras que los inconvenientes pierden su impacto.

Los resultados obtenidos en la investigación plantean relevantes implicaciones de gestión, especialmente para el diseño de estrategias y políticas dirigidas a fomentar el emprendimiento entre los estudiantes universitarios. En primer lugar, dado que la actitud hacia la creación de una empresa propia y, en definitiva, la intención de

desarrollar un proyecto emprendedor están determinadas por las ventajas que los estudiantes perciben en dicho comportamiento, parece evidente la necesidad de desarrollar campañas de comunicación y formación dirigidas a fomentar una mejor percepción y opinión general del proceso emprendedor y todo lo que de él se deriva. En este sentido, adquieren especial relevancia las actividades formativas integradas en los planes de estudio universitarios —asignaturas transversales y/u optativas, seminarios y/o prácticas profesionales, entre otras— orientadas en introducir a los estudiantes en el emprendimiento y destacar su importancia como vía para el desarrollo individual —tanto profesional como personal— y colectivo. De acuerdo con los resultados obtenidos en esta investigación, debería hacerse especial énfasis en destacar las recompensas económicas y personales de crear una empresa propia, así como la independencia y autonomía que supone para orientar la carrera profesional en la dirección deseada.

Así mismo, la influencia que el contexto social tiene en la decisión de emprendimiento pone de manifiesto la importancia de extender las campañas de comunicación a la sociedad en su conjunto. De este modo, desde el ámbito académico, político y social se debe concienciar a los ciudadanos de la importancia del emprendimiento como fenómeno generador de riqueza y empleo, y como alternativa fundamental para el desarrollo personal. Se trata, en definitiva, de prestigiar la figura del emprendedor como agente dinamizador de la economía y de la sociedad, de forma que la creación de una empresa propia sea percibida como una alternativa atractiva para los estudiantes universitarios y para el conjunto de los ciudadanos.

A pesar de la sistemática metodología seguida en su desarrollo, la investigación realizada presenta ciertas limitaciones. En primer lugar, cabe destacar que la utilización de una muestra de estudiantes de una única facultad puede plantear dudas respecto a la representatividad y generalización de los resultados obtenidos. De este modo, para profundizar en la comprensión del emprendimiento educativo en contextos universitarios (de gran transcendencia por el potencial emprendedor de los estudiantes, que se encuentran en la etapa previa a la incorporación al mercado laboral y, por tanto, deben afrontar la decisión de trabajar por cuenta ajena o crear su propio negocio) sería conveniente replicar el modelo propuesto sobre una muestra de estudiantes universitarios representativa en términos de titulaciones. Así mismo, sería interesante también contrastar su validez para explicar la intención de crear una empresa propia en otros contextos educativos, como la educación secundaria y la formación profesional. Por otro lado, la presente investigación contempla como variable dependiente la intención de emprendimiento, pero no se examina la conducta efectiva de los encuestados. Es decir, no se mide *a posteriori* si efectivamente la intención de emprendimiento se concreta en la creación de un negocio propio. En este sentido, en futuras investigaciones sería interesante examinar la conducta emprendedora efectiva de los sujetos e, incluso, contrastar la coincidencia entre intenciones y comportamiento emprendedor. Así mismo, cabe señalar como línea de investigación futura la posibilidad de replicar el modelo teórico en otros países con características económicas, culturales y legales diferentes, que pudieran afectar a la percepción de las ventajas e inconvenientes en el emprendimiento.

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Apéndice A

INTENCIÓN DE EMPRENDIMIENTO
INT1 – Estoy decidido a crear una empresa en el futuro.
INT2 – He pensado seriamente en crear una empresa.
INT3 – Tengo muy poca intención de crear una empresa algún día.
ACTITUD HACIA EL EMPRENDIMIENTO
ACT1 – Si tuviese la oportunidad y los recursos, me encantaría crear una empresa.
ACT2 – Entre varias opciones, preferiría ser cualquier cosa antes que emprendedor.
ACT3 – Ser empresario me supondría una gran satisfacción.
NORMA SUBJETIVA
SN1 – Mis amigos aprobarían mi decisión de crear una empresa.
SN2 – Mi familia más directa aprobaría mi decisión de crear una empresa.
SN3 – Mis compañeros aprobarían mi decisión de crear una empresa.
VENTAJAS DEL EMPRENDIMIENTO
VEN1 – Recompensas económicas (incrementar ingresos, etc.).
VEN2 – Independencia/autonomía (libertad personal, ser tu propio jefe, etc.).
VEN3 – Recompensas personales (reconocimiento público, crecimiento personal, probar que soy capaz de hacerlo, etc.).
VEN4 – Seguridad familiar y personal (asegurar mi futuro y el de mi familia, tradición familiar, etc.).
VEN5 – Invertir y conseguir un patrimonio personal.
INCONVENIENTES DEL EMPRENDIMIENTO
INC1 – Riesgo económico (riesgo demasiado elevado, situación económica, falta de un sueldo mínimo asegurado, etc.).
INC2 – Tiempo limitado para otras actividades, por tener que trabajar demasiadas horas (tiempo para la familia, la pareja, etc.).
INC3 – Temor a fracasar y quedar en ridículo.
INC4 – Reparos financieros o de capital (falta de capital inicial).
INC5 – Cargas fiscales.
INC6 – Desconocimiento sobre las regulaciones para poner en marcha una empresa.

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Section ARTICLES

Investigaciones Regionales

University Support in the Development of Regional Entrepreneurial Activity: An Exploratory Study from Chile

Carlos Poblete *, José Ernesto Amorós **

ABSTRACT: The theoretical literature has explored the potential benefits of the interaction between universities and entrepreneurs and there is some empirical evidence that supports the positive impact of entrepreneurship education in the subsequent propensity to become an entrepreneur. The purpose of this paper is study if higher education for entrepreneurship is reflected in entrepreneurship activities at the regional level. Replicating the methodology used by Coduras, Urban, Rojas and Martínez (2008) in Spain, we compare, in an exploratory way, the experience in Chile using data from the Global Entrepreneurship Monitor (GEM). The main results indicate that there is low interaction between entrepreneurs and universities and there is not enough impact to significantly affect entrepreneurial activity. Moreover, entrepreneurship education does not increase intentions to be an entrepreneur.

JEL Classification: I23; L26; O18.

Keywords: entrepreneurship; university-business interaction; promotion of entrepreneurship.

Apoyo de las Universidades en el desarrollo de la actividad emprendedora regional: un estudio exploratorio de Chile

RESUMEN: La literatura teórica ha estudiado los potenciales beneficios de la interacción entre universidades y emprendedores y existe cierta evidencia empírica que soporta la influencia positiva de la educación para el emprendimiento en la posterior propensión a emprender. El propósito de este artículo es estudiar si la educación específica para la creación de empresas brindada por las universidades se refleja en la actividad emprendedora a nivel regional. Replicando la metodología utilizada por Coduras, Urban, Rojas y Martínez (2008) en España, comparamos

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de forma exploratoria el caso en Chile usando la base de datos del Global Entrepreneurship Monitor (GEM). Los principales resultados indican que hay baja interacción entre emprendedores y universidades, y no hay impacto suficiente para afectar significativamente la actividad emprendedora. Así como contar con educación para el emprendimiento en la universidad no aumentaría la probabilidad de tener intenciones de emprender.

Clasificación JEL: I23; L26; O18.

Palabras clave: emprendimiento; interacción universidad-empresas; fomento del emprendimiento.

1. Introduction

Is education, specifically entrepreneurship education, a decisive factor for new business creation? The virtuous circle between economic development and education has been deeply studied in the academic literature (*e. g.*: Nelson and Phelps, 1966; Krueger and Lindahl, 2001) and a positive correlation has been observed between these two aspects (Barro, 1997). As educational level of the population increases, greater human capital may allow the development of commercial activities with greater efficiency. By consequence these mechanisms trigger an increase in productivity and, finally, results in economic growth. Regarding new business creation there is also relative agreement regarding the importance of entrepreneurship in sustainable economic development of countries (*e. g.*: Wennekers and Thurik, 1999; Van Stel, Carree and Thurik, 2005, Carland and Carland, 2004). Entrepreneurship increases the welfare of societies, mainly though three sources: 1) increasing the competence of markets; 2) generation of new jobs, and 3) by introducing new products and services. As a result, the incentives to pursue entrepreneurial activities are receiving more attention from policy and public-private programs (Audretsch, 2004).

Diverse theories indicate that entrepreneurial activities increase when high level of knowledge is present (Acs, 2010). In this sense, some studies mentioned that the economies (country or regional level) with high investment in new knowledge generation also have higher entrepreneurship levels (Audretch and Lehmann, 2005). In a classical point of view, many of the new knowledge results from formal educational systems like universities. But entrepreneurship is a complex and dynamic system in addition to the economic, political and social phenomena. Given this interdisciplinary nature, it is not easy for an educational system to provide skills and competencies for the development of entrepreneurship. Nevertheless, around the world there are an increasing number of educational programs that seek more and better entrepreneurship education. Paradoxically, studies examining entrepreneurial activity, such as the Global Entrepreneurship Monitor (GEM), indicate that the relationship between education and entrepreneurship is one of the weakest drivers evaluated based on its actual impact on rates of entrepreneurial activity (Coduras *et al.*, 2010;

Kelley *et al.*, 2011). A weak relationship between education and entrepreneurship is seen even in the most developed countries such as those belonging to the OECD (Poblete and Amorós, 2011).

While the development of the knowledge and skills needed to initiate a new business may be fostered along different stages and educational levels, it is the university —as the highest formal educational institution— where they are delivered in greater depth. At the same time, many university entrepreneurship education programs try to combine personal skills with technical business training. Additionally, universities can provide complementary and academical support —whether technological or scientific aspects— through research centers or other mechanisms, which allow businesses to work more efficiently. The university is a suitable place to develop innovation, either individually or collectively from students and academics. This network generated between academics and students can demonstrate not only strong ties between the university and existing or current businesses, but also to the creation of new ones.

In this study we intended to measure, in an exploratory way, the relationship between entrepreneurship education at universities and the propensity to undertake entrepreneurial behavior. For this study, we used the Global Entrepreneurship Monitor database, GEM in Chile, which allows a quantitative measurement of the development of entrepreneurship activities. This work follows the empirical methodology used by Coduras *et al.* (2008) in a study in Spain using two approaches: the first examines the relationship between a proxy of quality of entrepreneurship education at universities and the level of early stage entrepreneurship activities in 12 Chilean regions. For this analysis we used a regional database during the period 2007-2012. The second analysis tries to assess the impact of having specific entrepreneurship education in higher education (university or college) and the propensity to be an entrepreneur. For this second analysis we use individual level data from a special topic «Entrepreneurship Training and Education» in 2008.

The rest of the paper is structured as follows: the next section reviews the literature regarding the importance of the link between universities and businesses, and how this impacts on entrepreneurial activity. The third section, presents the methodology. Subsequently different statistical models are developed and the results are presented. Finally, we conclude.

2. Conceptual framework

2.1. The link between universities and (new) business creation

It is known that the development of economies should be through the efficient optimization of all available resources. However, Hawken *et al.* (1999) emphasize that economic development just through the exploitation of natural resources is not sustainable, because it exhausts the stock of these assets and limits the potential growth of social capital. It is in this aspect, sustainable economic growth, where is-

sues such as social capital play a fundamental role. Research regarding social capital for the combination of knowledge, skills, competencies and networks in civil societies (Nelson, 1998), suggests that education is essential to maintain the sustainability of growth (Psacharopoulos and Patrinos, 2002).

Even though each educational level plays a fundamental role in society, it is at the university where there is greater connection with industrial sectors. A majority of the extant research in this area has theoretically explored the importance of the relationship between companies and universities (see *e. g.* Etzkowitz, 1998) and its regional impact (Fritsch and Schwirten, 1999) concluding that the transfer of knowledge from university to industries generates substantial economic growth (Varga and Parag, 2009). This may be explained because the university-industry partnership allows a flow of knowledge, where those who cooperate —whether large or small companies— extend and complement their absorption capacity for generating applicable and marketable knowledge (Scott, 2003) [1].

Numerous benefits may result from the interaction between the academic and business worlds. Bonaccorsi and Piccaluga (1994) have identified at least four reasons why industrial sectors would be encouraged to have a strong relationship with universities: 1) obtaining quick access to scientific advances; 2) increasing feasibility through scientific models; 3) delegating selective development activities, including risk sharing and reduction of certain costs and 4) resolving the shortage of resources, such as laboratories and equipment. Universities also have incentives to pursue the relationship with industry. Romero (2007) summarizes three reasons —seeking of knowledge, political issues and financial aspects— that promote this interaction: 1) increasing the access to the knowledge generated in companies; 2) the belief that university-industry collaboration maximizes the probability to capture public research funds, and 3) industry would fund the research done in universities. Hence, since there are incentives for both sides to interact a strong bidirectional relationship between universities and industrial sectors should be observed.

In this sense independent or intrapreneurial entrepreneurship ventures could emerge in different sectors and in different manners, (Sharma and Chrisman, 1999; Parker, 2011). Many of the real and potential interactions between universities and industry could also be a trough of new business creation. For example many new technology companies may be closely related with the research done in universities within the area (Bania *et al.*, 1993; Markman *et al.*, 2005) even though not all research carried out in universities necessarily results in new products or services (Pavitt, 2001). However, the interaction between certain industry researchers and scholars can develop patterns of cooperation, which stimulates technological processes that increases productivity (Romer, 1986, 1990; Lucas, 1988), and also may affect the ability to identify and exploit (new) business opportunities (Cohen and Levinthal, 1989).

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[1] The academic literature has identified eight different ways, both formal and informal, of the formation of connections between industrial sectors and universities, which are: 1) joint laboratories; 2) independent companies resulting from strategic alliances (spin-off); 3) licensing agreements; 4) R&D contracts; 5) publications together; 6) presentation of results through conferences, exhibitions and media; 7) informal networking professionals, and 8) the flow of graduates to the productive sector (OECD, 2000).

The identification and exploitation of opportunities is one of the core aspects of the entrepreneurship process (Shane and Venkataraman, 2000). While some universities offer courses about entrepreneurship, especially through their business schools, generally these courses tend to focus on explaining the process of new venture formation and the recognition of business opportunities rather than assisting students in actually creating their own ventures. This could explain why most of those who receive this type of education do not necessarily have the intention to start a new business and throughout their education there is a variation in their entrepreneurial propensity. In this sense, voluntary education about entrepreneurship is more effective than a mandatory courses in increasing entrepreneurial intentions (Albornoz *et al.*, 2011).

Beyond those courses about entrepreneurship, GEM data provide evidence that entrepreneurial education is inadequate in all educational levels. It is noteworthy that GEM defines entrepreneurial education as a set of knowledge and skills related to starting a new business (Coduras *et al.*, 2010). This definition includes technical concepts, but also leadership skills, confidence and teamwork, among others. Therefore, it has been suggested that business schools probably are not the best developers of entrepreneurs (Katz, 2003).

The effect of universities on entrepreneurship should be explored in at least a couple of dimensions. Firstly, since increasingly most universities incorporate within their missions collaboration for social and economic growth, somehow this aspiration may affect entrepreneurial activity (Etzkowitz, 2003), since entrepreneurship generates an increase in social and economic welfare (Audretsch, 2004). Secondly, the university environment itself may impact the entrepreneurial spirit by increasing intentions to start businesses (Walter *et al.*, 2006, Krueger and Brazeal, 1994).

2.2. University entrepreneurship education: a regional approach and previous evidence from Chile

Mueller (2007) notes that geographical proximity plays a fundamental role for the efficient transfer of knowledge from universities to businesses. Coduras *et al.* (2008) found that in Spain the support of universities in promoting entrepreneurship does not provide statistically significant results to affect entrepreneurial activity in the country, despite evidence at the regional level, where regions with a higher entrepreneurial population level are also those who tend to perceive better university support.

Moreover, knowing someone who has created a new business, believing that one possesses the skills and knowledge to recognize good business opportunities; having training and perceiving that the university provides good support increases the likelihood of having entrepreneurial intentions. In this sense, there would be an impact on potential entrepreneurs. This study is based on diverse theories that explain the influence of the environment on individual intentions (Ajzen, 1991; Kruegel and Brazeal, 1994). While in Chile there is a general perception regarding the limited link between entrepreneurs and universities (Amorós and Poblete, 2011), we state that in regional-

aggregate terms there could be a positive potential interaction between universities and new business creation. As a consequence our first exploratory hypothesis is:

Hipothesis 1: At regional level, greater support given by universities though entrepreneurship education, increases early-stage entrepreneurial activity.

Empirical data in Chile indicates that the education variable (for entrepreneurship) is one of the most negative variables of the entrepreneurial framework conditions and local experts agree that an important constraint to the development of entrepreneurial activity is due to the limited training that currently available (Amorós and Poblete, 2012). Similarly, national and regional experts agree that local universities have not been able to properly transfer knowledge and technologies to entrepreneurs and only some companies, usually large and established, have a greater contact with educational institutions and therefore only those big/established companies would benefit from the advantages of the relationship. From the results observed in Spain, and based on the previous findings in Chile, we believe that there is not enough formal contact between universities and entrepreneurs to have an impact on entrepreneurial activity. Furthermore, it is likely that entrepreneurial intentions will not be affected significantly. Based on these antecedents we state our second hypothesis:

Hipothesis 2: The university-based entrepreneurship education has no significant influence on the intentions to be an entrepreneur in Chile.

3. Methodology

3.1. General data description

As has been already mentioned in the introduction, the data in this study come from the Global Entrepreneurship Monitor (GEM). The information used in GEM is collected through various primary and secondary sources (Reynolds *et al.*, 2005). Primary data from GEM comes from two surveys: the first one named the Adult Population Survey, APS, which collects information related to entrepreneurial attitudes of the population, entrepreneurial activities and entrepreneurs' aspirations. The second instrument is denominated National Expert Survey, NES, that provides information about the environment (entrepreneurial framework conditions) in which entrepreneurs should play at a national or regional level (Bosma *et al.*, 2012) [2].

The APS is a random survey of the population over 18 years old, which is stratified by gender, age and regions. In the case of Chile the stratification information is provided by the National Statistics Institute (INE) from the last Census conducted. The methodology of GEM (Reynolds *et al.*, 2005) requires a minimum of 2,000 cases nationwide, however, in the case of Chile and other countries, because it is

[2] For additional information about APS and NES foundations see Reynolds *et al.* (2005). Both surveys are in the public domain at *www.gemconsortium.org*.

performed at a regional level, 500 additional cases are added in each of the regions involved in the project. The GEM Chile project since 2007 has incorporated into its analysis a regional approach. By 2012 of the 15 regions, 12 have been involved in the project. This allows GEM indicators to project the entire adult population between 18-64 years of age (representing the majority of the economically active population) in every studied region. Table 1 summarizes the participation of the different regions of the country.

The NES requires that at least 36 experts be contacted where at least four of them must be a specialist in each of the nine entrepreneurial framework conditions. These nine conditions are: entrepreneurial finance, government policies, government entrepreneurship programs, entrepreneurship education, R&D transfer, commercial and professional infrastructure, Entry regulation, Physical infrastructure, and Cultural and social norms. Experts answer the degree of agreement or disagreement with certain statements that are made on a Likert scale of 5 points (where 1 means strongly disagree and 5 completely agree) and the results at the regional and national level are presented as the mean of each response.

Table 1. Regions involved in GEM Chile, by year

	Region	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*Total*
I	Tarapacá				X	X	X	3
II	Antofagasta	X	X	X	X	X	X	6
III	Atacama				X	X	X	3
IV	Coquimbo		X	X	X	X	X	5
V	Valparaíso	X	X	X	X	X	X	6
VI	Lib. Bdo. O'Higgins				X	X	X	3
VII	Maule				X	X	X	3
VIII	Bío - Bío	X	X	X	X	X	X	6
IX	Araucanía		X	X	X	X	X	5
XIII	Metropolitana	X	X	X	X	X	X	6
XIV	Los Ríos	X						1
XV	Arica y Parinacota			X	X	X	X	4
	Total	5	6	7	11	11	11	51

3.2. Analysis 1: Entrepreneurship education at universities and early-stage entrepreneurship at the regional level

Sample

In order to test the first hypothesis we used GEM data (both APS and NES) at a regional level from 2007 to 2012. APS at the regional level provides us the informa-

tion about entrepreneurial activity, and we used the experts view, taken from the NES database, to measure the university support for entrepreneurship.

Variables

As pointed out in the previous section, the relationship between universities and the business world, and therefore to entrepreneurship, can come from different areas and through formal and informal channels. The variable used in this research to measure the level of support from universities with entrepreneurial activity is as follows:

Do you consider that colleges, universities and higher education institutions provide adequate and quality preparation for starting up and growing new firms?

This variable is in the NES database. Therefore the experts in each region are the ones who —in a Likert scale of 1-5, with 1 being completely disagree and 5 completely agree— respond according to their perceptions of the local reality. From this we calculate a simple average of all expert responses.

Entrepreneurial activity

Three variables were selected to assess any changes in the entrepreneurial activity, the first one represents those who manifest to be early-stage entrepreneurs (TEA). GEM defines early-stage entrepreneurial activity as the percentage of the population, 18-64 years old, that currently own a new business for a period of less than 42 months. The second and third variable is derived from the TEA, but incorporates the educational level of entrepreneurs where the cut is given by whether or not they had college education. Thus, the second variable is the percentage of population with university education who is an entrepreneur and the third is the percentage of the population with no university education who is an entrepreneur. We consider university-educated individuals to be those respondents who indicated their last education level to be: incomplete university education, complete or some graduate studies (whether Master, PhD, Doctorate or equivalent). Similarly, those with their last educational level listed as primary education, secondary or technical training, are considered as individuals with no college education.

3.3. Analysis 2: Entrepreneurial intentions and specific entrepreneurship education in the university

Sample

For a second analysis we use variables taken only from the APS database. This second analysis looks to see the relationship between having had entrepreneurship education at university and the probability of being a potential entrepreneur.

In relation to the variable of entrepreneurship education in college, in 2008 a series of questions were added as part of the special topic (Education for entrepreneurship) in the adult population survey (APS), which emphasized the educational institution where it was made and whether the training was voluntary or mandatory. The variable used in this study was constructed by grouping all those who reported having received entrepreneurship education in college, regardless of whether it was mandatory or not. Since these questions were added only in 2008, the second analysis, which is related to the entrepreneurial intention, was performed using the database only for this year.

Variables

The variables measure: 1) entrepreneurial intentions; 2) contact with other entrepreneurs; 3) perception of good business opportunities; 4) recognition of having entrepreneurial skills; 5) fear of failure, and 6) possessing entrepreneurship education in college. The six variables are dichotomous, where the first five are derived from individual questions and the answer must be yes or no.

4. Results

4.1. Analysis 1: Entrepreneurship education at universities and early-stage entrepreneurship at regional level

Table 2 shows that apparently there is no clear pattern between perceived educational support of the universities and the percentage of the population with university education who is an entrepreneur. In this table, the data is sorted with respect to the average university support. It should be noted that the level of entrepreneurship in Chile during the period 2007-2012 had been steadily increasing. However, since 2011, the levels were significantly higher than what had previously been observed in the country (Amorós and Poblete, 2012).

Table 3 presents the correlation between different types of entrepreneurs with the level of support from universities. In this table we see that there is no statistically significant relationship between any of the variables that measure the support of universities perceived by the experts. Thus, we find no evidence of a relationship between the support of universities with the level of entrepreneurship in each region. In fact, it is only possible to state that the only variables shown to be related is the percentage of the population without university education who is an entrepreneur and TEA. This is consistent with the typical Chilean entrepreneurial profile (Amorós and Poblete, 2011). While these results were expected from table 2, the results might be interesting since they reveal a gap between university education and the creation of new businesses. In Chile, the universities have failed to have sufficient impact to alter the level of entrepreneurial activity.

Table 2. Total entrepreneurial population, population with and without university education who is an entrepreneur and university support, by region and year

Year	*Region*	*Total population TEA (%)*	*University education TEA (%)*	*No university education TEA (%)*	*Mean of universities support*
2009	Bío - Bío	14.4	14.3	12.8	2.97
2011	Lib. Bdo. O'Higgins	22.9	22	16.2	2.94
2008	Bío - Bío	15.4	15.9	12.3	2.91
2011	Valparaíso	21.3	21.3	17.2	2.86
2011	Maule	27	26.1	22.3	2.85
2011	Coquimbo	28.4	35.7	22.1	2.83
2010	Valparaíso	14.8	18	14.2	2.83
2009	Metropolitana	13.7	13.2	11.3	2.82
2011	Metropolitana	22	26.3	18.7	2.81
2009	Antofagasta	17.4	22.8	15	2.81
2010	Lib. Bdo. O'Higgins	16.3	16.1	16.4	2.8
2009	Valparaíso	16.4	17	13.5	2.79
2007	Bío - Bío	11.1	10.1	14.1	2.77
2010	Antofagasta	14.3	19.8	13.1	2.74
2007	Valparaiso	13.3	15.6	10	2.71
2010	Tarapacá	14	19.1	12.8	2.68
2012	Valparaíso	23.8	25.6	22.7	2.67
2010	Coquimbo	15.3	19.6	14.3	2.67
2009	Coquimbo	15.1	17.3	12.4	2.67
2011	Antofagasta	27.5	28.1	22	2.65
2010	Metropolitana	16	20.2	14.8	2.64
2012	Maule	22.5	25.1	21.3	2.63
2012	Bío - Bío	20.5	20.1	20.8	2.62
2008	Valparaíso	12.6	13.3	9.4	2.6
2012	Lib. Bdo. O'Higgins	22.6	24.2	21.6	2.59
2010	Maule	23.2	25.7	22.6	2.59
2011	Tarapacá	29.3	25.4	25.2	2.56
2010	Bío - Bío	19.7	17.4	20.1	2.56
2012	Araucanía	22.3	23.5	21.6	2.53
2012	Arica y Parinacota	23.8	21.9	25	2.53
2011	Arica y Parinacota	27.7	33.7	23.6	2.53

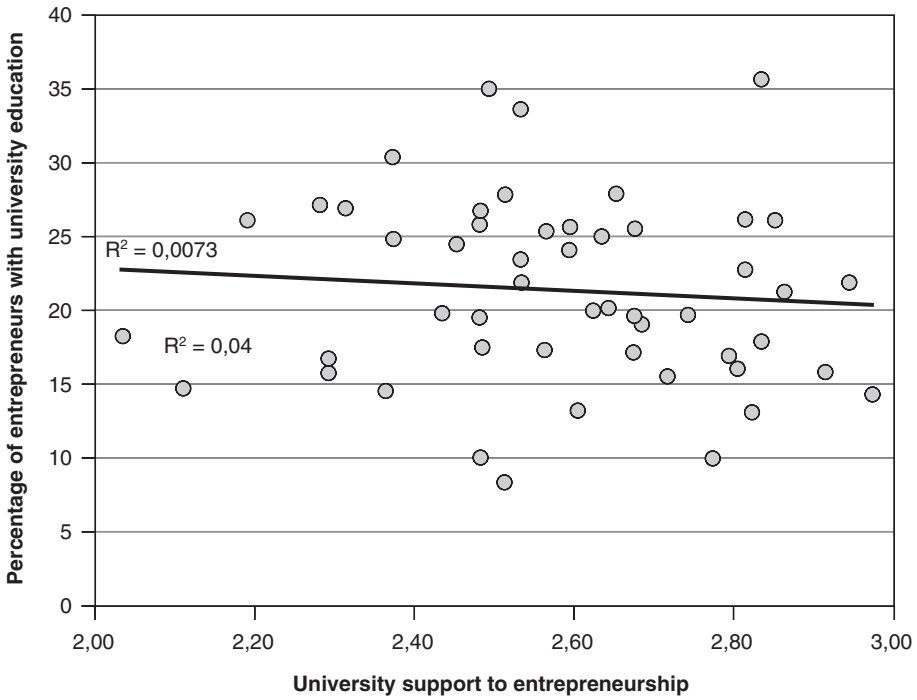
Table 2. *(continue)*

Year	*Region*	*Total population TEA (%)*	*University education TEA (%)*	*No university education TEA (%)*	*Mean of universities support*
2012	Coquimbo	24.5	27.9	22.5	2.51
2008	Metropolitana	10.2	8.5	9.5	2.51
2011	Araucanía	23.7	35.1	21	2.49
2012	Tarapacá	26.9	26.9	26.9	2.48
2010	Atacama	15.4	25.9	13.1	2.48
2009	Arica y Parinacota	17.8	17.6	14.9	2.48
2008	Coquimbo	17.6	10.2	15.5	2.48
2007	Metropolitana	16.2	19.6	12.7	2.48
2010	Arica y Parinacota	18.6	24.6	17.8	2.45
2009	Araucanía	16.6	19.9	12.5	2.43
2012	Antofagasta	24.7	30.4	20.9	2.37
2011	Atacama	26.4	25	23.3	2.37
2008	Araucanía	15.4	14.7	13.3	2.36
2012	Metropolitana	23.6	27	21.7	2.31
2010	Araucanía	13.5	15.9	12.9	2.29
2008	Antofagasta	15.9	16.8	12.7	2.29
2011	Bío - Bío	21.3	27.3	18.2	2.28
2012	Atacama	25.4	26.2	25.1	2.19
2007	Antofagasta	13.3	14.8	12.5	2.11
2007	de los Ríos	13.9	18.2	10.8	2.03

Table 3. Correlation analysis between different TEA's and the perception of universities support to entrepreneurship

	Support of universities to entrepreneurship	*Total population TEA (%)*	*University education TEA (%)*	*No university education TEA (%)*
Support of universities to entrepreneurship	1			
Total population TEA (%)	–0.033	1		
University education TEA (%)	–0.085	0.839**	1	
No university education TEA (%)	–0.088	–0.934	0.751**	1

Figure 1. Lineal and cubic curve of the relationship between the percentage of the population with university education who is an entrepreneur and university support



As is observed in figure 1, for the Chilean case, the support given by universities to entrepreneurship with the percentage of university-educated entrepreneurs demonstrates a complex relationship. In Chile, through a linear or cubic regression, there is negligible chance to find a statistical relationship amongst the variables. The low R^2 observed in both cases confirms that these models are not sufficient to infer the interaction between these variables. Despite this, bearing in mind the low predictability that the nonlinear regression demonstrates, the model indicates that the support given by the universities to entrepreneurship increases entrepreneurial activity to a certain level, close to 23%. Yet it later decreases.

We conclude in an exploratory way that we can not confirm our Hypothesis 1 which suggested that greater support given by universities though entrepreneurship education would result in higher early-stage entrepreneurial activity

4.2. Analysis 2: Entrepreneurial intentions and specific entrepreneurship education in the university

The second analysis was performed in order to analyze another approach to measure the impacts the universities have on developing entrepreneurship. Through logistic regression we wanted to test whether having entrepreneurship education in university impacts entrepreneurial intentions. Unlike the previous analysis, which was regional, this is at an individual level and only uses 2008 data.

Table 4 provides a descriptive analysis of the variables used, table 5 shows the correlation between the variables of the model and table 6 summarizes the results of the logistic regression. The correlation table shows how most of the variables analyzed are related to the expectations of starting up, except for the perception of the support given by the universities. While fear of failure and age have an inverse relationship with entrepreneurial intentions, the other variables show a direct relationship.

Table 4. Descriptive information about the variables used in the entrepreneurial intention model

Binary variables	*Frecuence*	*Percentaje*
Entrepreneurial intention (1 = yes)	1,490	34.2
Entrepreneurship education in university (1 = yes)	323	16.2
Know others entrepreneurs (1 = yes)	1,571	47.8
Perceived future good business opportunities (1 = yes)	846	30.1
Skills and knowledge to initiate a new business (1 = yes)	2,038	63.1
Fear of failure prevent initiate a new business (1 = yes)	1,207	37.2
Gender (1 = male)	1,845	40.9
Continued variable	*Average*	*Std. Dev.*
Age	42	21.553

Regarding the likelihood of having entrepreneurial intentions, in table 6 we see that it is higher in people who know someone who has created a new business, perceive that she has the knowledge and skills to initiate a new business and advancing age decreases the propensity of being an entrepreneur. Having entrepreneurship education in university, gender and fear of failure were not significant predictors of the propensity to have entrepreneurial intentions.

Based on the previous results we confirm our Hypothesis 2 related to the fact that in Chile university-based entrepreneurship education has no significant influence on the intentions to be an entrepreneur.

Table 5. Correlation Matrix

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1. Entrepreneurial Intention	1							
2. Entrepreneurship education in university	0.128**	1						
3. Know others entrepreneurs	0.272**	0.159**	1					
4. Perceived future good business opportunities	0.162**	0.017	0.120**	1				
5. Skills and knowledge to initiate a new business	0.306**	0.225**	0.249**	0.126**	1			
6. Fear of failure prevent initiate a new business	–0.107**	–0.092**	–0.075**	–0.125**	–0.163**	1		
7. Gender	–0.128**	–0.158**	–0.098**	–0.084**	–0.210**	0.116**	1	
8. Age	–0.101**	–0.186**	–0.151**	–0.060*	0.040	0.050*	0.026	1

Table 6. Estimated probabilities for entrepreneurial intentions in people with university education

	B	*T.E.*	*Wald*	*gl*	*Sig.*	*Exp(B)*	*C.I. 95% EXP(B)*	
							Low	*High*
Entrepreneurship education in university	0.121	0.218	0.307	1	0.580	1.128	0.736	1.730
Know others entrepreneurs	0.631	0.172	13.423	1	**0.000**	1.879	1.341	2.633
Perceived future good business opportunities	0.393	0.184	4.552	1	0.033	1.482	1.033	2.127
Entrepreneurial skills	1.532	0.202	57.351	1	**0.000**	4.628	3.113	6.880
Fear of failure	–0.253	0.180	1.980	1	0.159	0.777	0.546	1.104
Gender	0.014	0.173	0.006	1	0.936	1.014	0.722	1.425
Age	–0.023	0.006	13.486	1	**0.000**	0.978	0.966	0.989
Constant	–1.066	0.414	6.632	1	**0.010**	0.344		
Statistics								
Number of cases	751							
R^2 Nagelkerke	0.175							
R^2 Cox and Snell	0.241							

5. Conclusions and implications

In Chile, the level of contact between universities and the business world is scarce. Entrepreneurs generally do not receive enough support from the universities to encourage the creation of new businesses. Mueller (2007) points out that, despite the relevance of all forms of entrepreneurship, an increase in entrepreneurial activity that incorporates innovation is more crucial than entrepreneurial activity in general. Therefore the low linkages observed between universities and entrepreneurship avoids contact with a potential provider of innovation. Additionally, Mueller (2007) suggest that in order to make an efficient transfer, an important component is the geographical proximity. Regions with little research would be characterized by a low capacity to absorb new knowledge, which means they experience lower levels of economic growth.

From the observed data, we can suggest that the support provided by universities has no direct impact on promoting entrepreneurship. In this sense, the benefits that could be generated would not be achieved. This result is also similar in other countries (Arenius and Ehrstedt, 2008). Certainly several aspects may help to understand this phenomenon. One is that in general entrepreneurship education in universities is not well developed across the country and there is little variation among the regions (Amorós *et al.*, 2013). Other potential issues in Chile, relates to intellectual property rights. The fact that the legislation, and the local culture itself, fails to establish trust

in those who develop new products or knowledge may explain why it is hard to observe a formal link between scientists and entrepreneurs (Poblete and Amorós, 2010). Moreover, the lack of transfer of R&D, which is strongly related to the previous topic, is also limiting the development of entrepreneurial activity in Chile.

At an individual level we find that people who have a university degree, and had specific entrepreneurship education do not have a higher propensity to become entrepreneurs than those who had no entrepreneurship education. However, we found new empirical support in this study regarding the perception of good future opportunities; meeting other entrepreneurs, and the perceived skills to initiate a new business with entrepreneurial intentions. This has been thoroughly studied in the literature and the results of this study simply confirm this relationship (Kwon and Arenius, 2010).

In Chile, the development of research is concentrated mainly in universities and given the results observed in this study, there is a void that would be hurting all society actors who have not been able to reap the benefits achieved from a strong relationship between universities and entrepreneurs. GEM reports in Chile (Amorós and Poblete, 2011, 2012) states that in general in the early-stage entrepreneurial activity and in the established one, entrepreneurs do not incorporate new technologies and the percentage of university-educated entrepreneurs are a minority of total entrepreneurs in the country.

The results obtained from these studies may be limited by the specific characteristics of the variables used to measure each aspect, and also the sample used in each study (regional and individual approach) could restrict the outcome achieved. Therefore there is a possibility that a similar study using others variables may present different results than the ones we exposed in this work.

Because this study is based on previous research conduced in Spain by Coduras *et al.* (2008), future research could explore an in-depth comparison of these countries using merged databases to explore the relationship between entrepreneurship education and new business activities on a regional basis. Both countries have some similarities on the composition of the early-stage entrepreneurial activity. Both are mainly focused on providing services to the consumer. In relation to technology, which could be associated with R&D in universities, in both cases, close to 6% of early-stage entrepreneurial activity is in technology industries. The differences between the two countries are seen primarily in terms of attitudes toward entrepreneurship. In Chile there is a significantly higher percentage of entrepreneurial intentions, perception of good opportunities, perception of knowledge and entrepreneurial skills and lower levels of fear of failure. Moreover, the levels of entrepreneurial activity in Chile are significantly higher than in Spain. The generation of necessity entrepreneurship in terms of the total percentage of entrepreneurship is similar in both countries. The biggest difference is given mainly by the entrepreneurs motivated by the search for greater incomes, which in Spain is less common.

In Chile the population's attitudes toward entrepreneurship are higher than those observed in Spain, which may help to explain the difference between the impacts of universities on the propensity to become potential entrepreneurs. In comparison

terms, it is possible that in Spain, in the context where there are low entrepreneurial attitudes developed in the population, the effort of universities is sufficient to generate a change at least in terms of propensity to demonstrate entrepreneurial intentions.

Because the support given by the universities is analyzed in relation to the perception of experts only in this study, the results are subject to biases inherent in those who were chosen as experts. Future research should analyze whether it is possible to demonstration an empirical relationship between the contribution given by universities and the potential impact it could generate. As we demonstrated in this study, we could not observe a significant direct contribution, but maybe it exists as a mediator between the attitudes towards entrepreneurship and entrepreneurial intensions, or in the creation of new businesses.

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Section ARTICLES

The informal investment context: specific issues concerned with business angels

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ABSTRACT: Informal investors play a key role to meet the financing needs of business projects in early stages. However, this is a group in which there are different kinds and ways of dealing with investment. One of these profiles is associated with the figure known as business angel, whose main distinguishing feature is its ability to add smart capital in the form of knowledge, experience and contacts. The aim of this paper is to determine to what extent the specific profile of business angels differ from the rest of informal investors. With a sample of over 800 informal investors in Spain, the empirical results of this study show that the higher income, skills and entrepreneurial training and the less family ties to the entrepreneur, the greater the probability of belonging to *business angel* investment group.

JEL Classification: G29.

Keywords: informal investing; business angels; entrepreneurship.

El contexto inversor informal: especificidades del segmento de los *business angels*

RESUMEN: Los inversores informales desempeñan un papel fundamental para cubrir las necesidades de financiación de los proyectos de negocio en fase emprendedora. Sin embargo, se trata de un segmento en el que cohabitan distintas tipologías y maneras de afrontar la inversión. Uno de estos perfiles se asocia a la figura conocida como inversor ángel o *business angel*, cuyo principal rasgo diferenciador reside en su capacidad para aportar un capital inteligente en forma de conocimiento, experiencia y contactos. El objetivo de este trabajo persigue conocer en qué medida el perfil específico de los *business angels* difiere del resto de inversores informales. Con una muestra de más de 800 inversores informales en España, los resultados empíricos de este trabajo ponen de manifiesto que a mayor nivel de renta, mayores habilidades y formación específica para emprender

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y menor vínculo familiar con el emprendedor, siendo mayor la probabilidad de pertenecer al segmento *business angel* de inversión informal.

Clasificación JEL: G29.

Palabras clave: inversión informal; *business angels*; actividad emprendedora.

1. Introduction

«Business angels» are becoming fundamental figures in efforts to close the equity gap encountered by start-ups at the outset of their projects (Harrison and Mason, 1999; Van Osnabrugge and Robinson, 2000). Once entrepreneurs have exhausted the funding available from the 3Fs (Family, Friends and Fools) that gap widens considerably, to between € 100,000 and € 2 million. This bracket is relatively unattractive to venture capital funds, which tend to opt for more conservative investment policies (projects that have survived beyond the initial stages of their start-up) and increasingly high minimum capital requirements for entry (OECD, 2011).

Business angels form part of the informal investment sector that can be found in all economies. However the financing market is highly heterogeneous, and the terms «informal investor» and «business angel» are not always synonymous (Avdeitchikova *et al*., 2008): the latter not only provide capital but also engage actively withstart-ups [1] by supplying expertise, know-how, experience and facilitating access to their networks of contacts.

This study seeks to determine to what extent and in what aspects the socioeconomic profile of business angels is significantly different from that of other informal investors in Spain. Specifically, an analysis is conducted to determine whether variables such as education level, income level and past entrepreneurial experience can be used to draw a significant distinction between different groups of informal investors (business angels and non business angels).

To that end a sample of over 800 informal investors in Spain is examined, located on the basis of data compiled by the GEM (Global Entrepreneurship Monitor) survey in 2010. From this group the GEM regional team for the Basque Country has obtained a sub-sample of investors who meet the criteria for consideration as business angels, *i. e.* they provide capital and experience and become actively engaged in the projects that they finance.

This paper's main contribution to the relevant literature lies in providing data to improve knowledge of the characteristics of informal financing markets, to which

[1] «Start-up» is a blanket term that covers numerous newly created undertakings and businesses in the early stages of development. According to the GEM (Global Entrepreneurship Monitor) project the «early stage» is the entrepreneurial stage od a business, which is deemed to cover its first 3.5 years of operation. A distinction must be drawn between start-ups and spin-offs: the latter are created to exploit and market technology or knowledge created by an organisation (corporate spin-offs) or by a university or research centre (academic spin-offs) (Heirman and Clarysse, 2004; Pirnay *et al.*, 2003).

little attention has been paid in the past by empirical literature. This may be partly because the investors involved keep a low profile and are hard to identify (Mason and Harrison, 2008).

The paper is presented in ten sections. Sections 2 and 4 review the relevant theory, seeking to clarify the nature and the peculiarities of informal investment and, more specifically, to analyse the important role played by business angels in financing start-ups. Section 4 outlines the hypotheses used in search of significant differences within the informal investment sector. Sections 5 and 6 then examine the methodology applied and the statistical analyses conducted, and sections 7 and 8 present and discuss the results of those analyses. Finally, the main conclusions are outlined and some comments are provided concerning limitations and lines for future research.

2. The concept of informal investment

Business angels form part of the informal investment sector that exists in all economies, which some authors refer to as the «informal venture capital market». However this market is highly heterogeneous and contains investors of various kinds (Politis, 2008). Indeed, the theoretical debate in the relevant branch of literature is still ongoing, and there is some uncertainty as to what definitions and terminology should be used (Avdeitchikova *et al*., 2008).

Mason and Harrison (2000, 137) define «informal investors» as «private individuals who make investments directly in unlisted companies in which they have no family connection». The main difference between this and the definition of a business angel is that it does not specify that the investors take an active part in the projects that they finance, so it does not envisage the transfer of smart capital that characterises «angel investments».

Nor does this definition of informal investors include persons close to the entrepreneur who provide funds, *e. g.* relatives and friends. According to Mason and Harrison (2000) and Maula *et al.* (2005) the reasons why such people make contributions are different from those that prevail among professional investors, so they should not be counted strictly as informal investors. Moreover, since such funding is provided for reasons concerned exclusively with family ties and friendship, it does not meet the requirement of forming a market.

However not all the researchers in this field agree that this funding (such investors are also known as the 3Fs —Family, Friends and Fools— and their contributions as «love money») should be excluded. Indeed, there is currently a debate ongoing in the specialist literature as to whether they should be counted as part of the informal investment market (Avdeitchikova *et al*., 2008).

The GEM project, for instance, uses a broader definition of the term «informal investor» that includes the 3Fs. Reynolds *et al.* (2003) conclude that micro-investments from the 3Fs account for around 80% of the external resources required by start-ups, and are therefore relatively important enough to merit inclusion in the informal fi-

nancing market. Erikson *et al.* (2003) introduce the concept of «family angels», *i. e.* persons who invest in projects to which they have family connections, and conclude that such angels tend to make their investments earlier and in less innovative businesses than other informal investors, and that they provide more patient capital.

Since we are aware of this lack of consensus as to what constitutes an informal investor (Avdeitchikova *et al*., 2008), we seek to provide an approach here that will help clarify the nature of this form of investment by distinguishing between business angels and other informal investors. To establish this distinction we take as our basis what we believe to be the single element on which there is complete academic and institutional consensus concerning what constitutes a business angel: the ability to bring not just capital but also knowledge and experience to investment projects.

This means that the main characteristic or feature identifying an informal investor as a business angel is his/her ability and willingness to provide smart capital in the form of business know-how, commercial expertise, experience or his/her own network of business contacts (Mason and Harrison, 1995; Aernoudt, 2005). It is precisely this added value that other informal investors lack.

We have decided not to use links between investors and entrepreneurs as a variable by which investors can be distinguished from one another. In this study we relax the assumptions used in the definition given by Mason and Harrison (2008) [2], who assert that business angels do not maintain family links with the beneficiaries of their investments, and opt instead for a broader definition based solely on whether an investor provides projects with smart capital [3].

3. Types of informal investment: business angels

As described above, a business angel is a private investor who provides start-ups with capital but also engages more or less actively in the development of the project funded, placing his/her network of contacts and experience at the disposal of the entrepreneur (De Clercq *et al.*, 2006). Such investors sometimes work via networks (Christensen, 2011), the specific workings of which may be more or less professionalised (Maxwell *et al.*, 2011).

Although it is hard to generalise (Mason and Harrison, 2000), the typical profile of a business angel seems to be an entrepreneur or business executive (either working

[2] Mason and Harrison (2008, 309) define a business angel as «a high net worth individual, acting alone or in a formal or informal syndicate, who invests his or her own money directly in an unquoted business in which there is no family connection and who, after making the investment, generally takes an active involvement in the business».

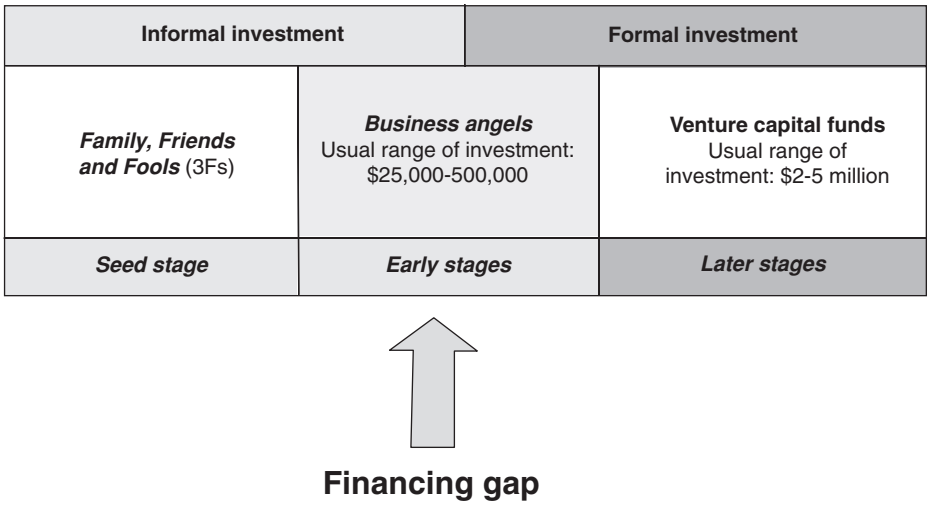
[3] In line with the criterion followed here it makes no sense not to include as business angels investors who provide smart capital but also have ties through family or friendship with the entrepreneurs that they support. Direct observation, *e. g.* at talks and presentations given by business angels as part of networks or platforms, supports this contention: cases can be found of business angels who have supported projects led by members of their inner circle of friends or relatives.

or retired) with a high net worth, experience in entrepreneurship and broad-ranging business expertise, who is willing to invest between 20,000 and 250,000 euros per project (Díaz *et al.*, 2010).

The angel investment market is essentially local or regional in scope (Lengyel and Gulliford, 1997; Harrison *et al.*, 2010), with angels favouring projects located close to home. They are willing to invest in a broad range of activities, including the service sector, are capable of accepting long maturity periods and offer patient capital with more relaxed disinvestment calendars and more flexible exit strategies.

It is fundamental that the role of business angels be fostered and developed to cover the equity gap suffered by start-ups in their early stages (Harrison *et al.*, 2010). They are of key importance in that they occupy a critical position as providers of transitional funding when entrepreneurs have exhausted the sources of funds closest at hand, *i. e.* the 3Fs, but do not yet have a long enough track record to earn themselves access to venture capital or to bring in an industrial partner (see figure 1). This is why public institutions are showing increasing interest in developing networks to promote business angels as alternative sources of financing (Collewaert *et al.*, 2010).

Figure 1. Business angels: range of investment and coverage of equity gap



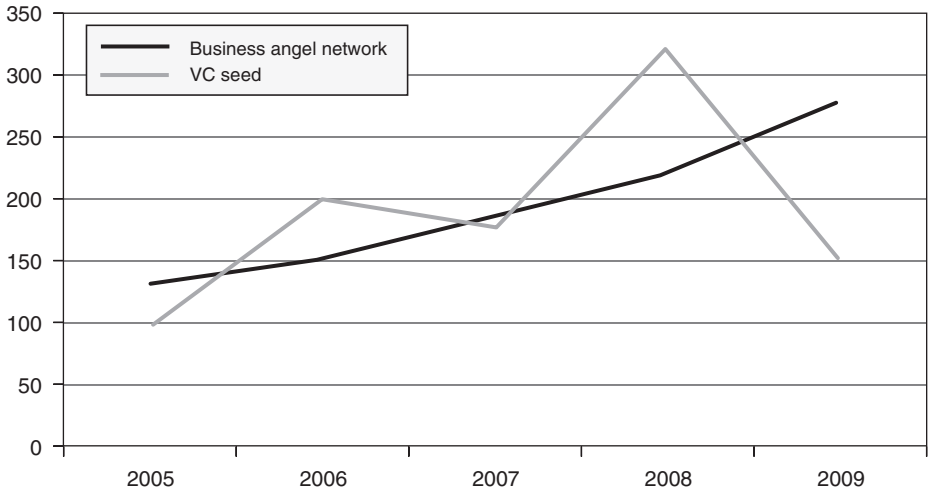
Source: OECD (2011).

Moreover, the role of angel investors is revealed as even more important when trends in the venture capital market are taken into account. Changes can be observed in the profile of investors in young technology-based firms, with an increasing presence of the public sector and of informal investors, while venture capital concerns are tending to turn rather to investments in more mature projects, with larger volumes

of investment per operation (Fernández and Ubierna, 2011). The OECD (2011) estimates that in 2009 Business Angel Networks (BANs) in Europe mobilised more funding than venture capital operators and funds in regard to seed-stage projects (see Graph 1).

The major challenge facing the angel investment sector is to increase in size and raise the average volume of funds provided. There is a need to move towards formulae involving syndicated funding by more than one business angel or joint investment operations with venture capital funds (OECD, 2011) if business angels aspire to cover today's increasingly wide equity gaps, which currently average between $500,000 and $2 million (EBAN, 2010).

Graph 1. Business Angel Network (BAN) and venture capital seed investment in Europe 2005-2009. EUR millions



Source: OECD (2011) based on EBAN and EVCA data.

4. Business angels and other informal investors: differences in profiles

This paper sets out to determine whether the socio-economic profile of business angels in Spain is significantly different from that of other informal investors. Business angels contribute actively to the development of the companies in which they invest, so it is important to learn what their profile as investors looks like. To that end, we examine the variables of education level, entrepreneurial skills and expertise, entrepreneurial experience and net worth.

4.1. Education Level

Previous studies (Freear *et al.*, 1994; Mason and Harrison, 2000; Wong and Ho, 2007) confirm that the typical informal investor is an individual with a high or medium-to-high level of education. According to GEM data for 2010, around 60% of such investors hold university-level qualifications (Güemes *et al.*, 2010), a figure far higher than the percentage for the adult population as a whole in Spain [4].

Based on this evidence, this paper seeks to determine whether informal investors who match the profile for classification as business angels include a higher-than-average proportion of degree holders. Business angels are characterised in particular by not just providing financial support but also advice and actual assistance. Although such contributions depend on their management experience and their social capital and not necessarily on their level of education, we feel that the data available (more university graduates among informal investors) can serve as the basis for our first working hypothesis (H_1):

Hypothesis 1 (H_1): The fact that an investor holds a university-level qualification increases the probability of his/her belonging to the business angel category of informal investors.

4.2. Skills and Specific Training in Creating Start-ups

In line with the tenets of hypothesis 1 (H_1), hypothesis 2 (H_2) also examines the training and skills of investors. However, this time the objective is to determine whether there are significant differences between groups of investors in terms of specific entrepreneurial skills and expertise. According to the 2010 GEM report on Spain (Güemes *et al.*, 2010), 78.6% of informal investors see themselves as holding the skills and expertise required for entrepreneurship, compared to a figure of 50.2% among the rest of the adult population of Spain. Our third hypothesis (H_3) suggests that the figure is even higher among the specific group of business angels. Our second working hypothesis (H_2) therefore looks like this:

Hypothesis 2 (H_2): possession of the specific skills and expertise required to create a start-up increases the probability of an informal investor belonging to the business angel category.

4.3. Entrepreneurial Experience

Theory-based literature sees business angels as investors with high levels of education, entrepreneurial and business experience and a high level of financial culture,

[4] According to the report Overview of Education: OECD Indicators 2011 (Ministry of Education, 2011), 30% of the adult population of Spain hold higher-education qualifications.

as required to make such investments (Freear *et al.*, 1994; Mason and Harrison, 2000; Politis and Landström, 2002; Maula *et al*., 2005). Indeed, they tend to invest in business sectors and technologies that they know well, which means that the level of value added that they can offer projects is high.

Some empirical research projects in this area have also concluded that business angels are currently or have in the past been entrepreneurs themselves, and that they have, in their careers, held posts concerned with the management and administration of new companies. This gives them broad experience in company start-ups (Freear *et al.*, 1994; Mason and Harrison, 2000; Politis and Landström, 2002; Maula *et al*., 2005).

Our initial hypothesis here is that business angels possess significantly greater entrepreneurial experience than other informal investors. To check this out, we examine the proportion of start-up entrepreneurs (involved in projects that have been running for less than 3.5 years) (H3a), of potential entrepreneurs (H3b), and of individuals who have been involved in the winding up of a company within the past year (H3c) in the group. These hypotheses are formulated as follows:

Hypothesis 3 (H_3): the more entrepreneurial experience an informal investor has, the more likely he/she is to belong to the business angel category.

Hypothesis 3a (H_{3a}): investors who at the same time also work as entrepreneurs on business projects that have been running for less than 3.5 years are more likely to belong to the business angel category of informal investors.

Hypothesis 3b (H_{3b}): informal investors who at the same time expect to start up entrepreneurial projects within the next three years (potential entrepreneurs) are more likely to belong to the business angel category of informal investors.

Hypothesis 3c (H_{3c}): informal investors who have taken part in the winding up of a business project within the past year are more likely to belong to the business angel category of informal investors.

4.4. Income Level

The likelihood of an individual acting as an informal investor seems initially to be positively correlated to his/her income level. The literature on entrepreneurship (Freear *et al.*, 1994; Harrison and Mason, 1992) establishes that business angels have high net worth and income levels. However, empirical studies such as that of Maula *et al.* (2005) find no evidence for this. Here our initial hypothesis (H_4) is that the income levels of business angels are higher than those of other informal investors. This fourth hypothesis is formulated as follows:

Hypothesis 4 (H_4): the higher the income level of an investor is, the more likely it is that he/she belongs to the business angel category.

4.5. Relationship between Investors and Entrepreneurs

Pre-existing relationships between investors and entrepreneurs comprise another variable that we analyse here. Data from the 2010 GEM report for Spain (Güemes *et al.*, 2010) reveal the prevalence of close links (family ties, friendship, working environment) between investors and entrepreneurs. As indicated above, we do not exclude from the business angel category those investors who provide capital and expertise for projects set up by entrepreneurs with whom they have family ties or links of friendship. However, we do seek to check whether such links are less frequent among business angels.

In this case the number of investors with a more professional profile may be expected to be greater. Indeed, business angels are tending to act increasingly through professional or more formal channels such as networks, forums or investment clubs, where they establish professional relationships with entrepreneurs with whom they are not initially connected by kinship or close proximity. The relevant hypothesis is formulated as follows:

Hypothesis 5 (H_5): the more prior links they have with entrepreneurs based on family ties or friendship, the less likely informal investors are to belong to the business angel category.

4.6. Average Volume of Investment

Business angels act from a more professional viewpoint than other informal investors, investing in high-potential start-ups and weighing up and selecting their investment choices on the basis of stricter criteria. Their involvement in projects on a larger scale leads to hypothesis (H_6), which posits that their average capital contribution is greater than the average contribution of other informal investors.

Hypothesis 6 (H_6): The bigger the volume of capital provided, the more likely it is that an informal investor belongs to the business angel category.

5. Method

The data used are those gathered by the Global Entrepreneurship Monitor [5] (GEM) project for the adult population (aged over 18 and under 65) of the whole of Spain between April and June 2010. The questionnaire used is the same one used in the GEM method, which is common to all the countries and regions where the project is implemented. The CATI (Computer-Assisted Telephone Interviewing) software program was used to ensure that interviews were properly conducted, recorded and encoded. The technical data file for the sample is presented in table 1.

[5] For more information on the project see *www.gemconsortium.org*.

Table 1. Technical data file for the GEM survey on the population aged 18-64

Universe	30,741,514 people aged between 18 and 64 living in Spain.
Sample	26,388 individuals aged between 18 and 64.
Sample selection	Multi-stage sampling: random selection of cities and municipalities in provinces depending on the scope and population quotas resident in municipalities with more than 5000 residents (urban population) and less than 5000 residents (rural population). In stage two, telephone numbers for each municipality were obtained at random. Finally, individuals aged between 18 and 64 were selected, with quotas for each sex and age-group proportional to the population of each regional autonomous community.
Method	CATI (Computer-Assisted Telephone Interviewing).
Sample error (+/–)	+/– 0.6% a priori and +/– 0.24% a posteriori.
Confidence level	95%
Survey period	April-July 2009.

(1) *Source:* US Census 2010, based on INE data.
(2) The sample error was calculated for infinite populations.
Hypothesis: P = Q = 50% or maximum indeterminacy.

Among many other issues, the GEM survey enables Spain's informal investors to be identified. An «informal investor» is defined as an adult (aged 18-64) who has invested his/her own money in a business run by others in the past three years [6]. Extrapolating the answers to the question of whether respondents considered themselves to match this definition, 3.2% of the adult population of Spain can be said to fall within this category. This gives us a sample of 854 informal investors here.

Secondly, since that this study was undertaken to identify those members of the overall group of informal investors who fitted the profile for consideration as business angels, the GEM research team in the Basque Country incorporated into the standard questionnaire a set of specific questions aimed at doing just that. Accordingly, persons already identified as informal investors (3.2% of the population aged between 18 and 64) were asked whether they provided management or entrepreneurial experience and expertise for the start-ups that they financed as well as capital.

35.7% of the respondents identified as informal investors answered yes to this question. This can be taken as showing that almost four out of ten informal investors in Spain can be considered as business angels in the sense that they claim to provide smart capital to the start-ups in which they invest. The remaining 63%, *i. e.* the majority, provide only financial support for start-upsand do not involve themselves actively or provide assessment based on their own professional experience or expertise. This is the position typically held by those who fall into the category of the 3Fs.

[6] This excludes investment in bonds, shares and investment funds.

6. Variables and statistical method

The working hypotheses drawn up are checked out using logistic regression analysis, also known as «logit analysis», a statistical procedure that has proved especially useful in cases where the presence or absence of a characteristic or result is to be predicted according to the figures obtained for a number of forecast variables. Its use is appropriate here since it provides a number of coefficients or weightings for independent variables that highlight the ability of each one to distinguish between the groups established in accordance with the dependent variable (business angels vs. non business angels).

The forecast of whether an individual belongs to one group or the other is based on the likelihood of an event occurring. The function obtained in the regression thus provides a value or forecast probability of between zero and one in each case, enabling cases to be allocated to one group or the other [7]. The regression coefficients of the independent variables here were obtained with the input method, comprising the inputting of all the specific variables in the model in a single operation [8].

The dependent variable is encoded as follows: 1 = informal investors considered to be business angels and 0 = the rest. The independent dummy and metric variables cover the various points to be analysed: education level (higher education), entrepreneurial experience, specific training for the creation of start-ups, relationship between investors and entrepreneurs, income level [9] and volume of investment. The encoding of all the variables analysed is shown in table 2. In the case of entrepreneurial experience several variables are used: firstly the TEA [10] indicator, which in this study measures the percentage of investors who are also involved as entrepreneurs in business projects that have been running for less than 42 months (TEA variable); secondly those investors who state that they intend to start up new businesses within the next three years (EXPECT variable); and thirdly those informal investors who have been involved in the winding up or closing down of a business undertaking in the past year (CLOSE-DOWN variable).

Two variables are used in regard to specific training in the creation of start-ups: the first is an objective variable (SKILLS2) that establishes whether an informal investor has received specific training related to the creation of start-ups at any time in

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[7] To this end a cut-off point for the logistic function needs to be set, above which cases are allocated to one group and below which they are allocated to the other (Pérez, 2005). In this study the cut-off point used is 0.5. This is the default setting in most statistics packages, including SPSS.

[8] Correlation analysis of the full set of independent variables specified in the model shows no significant link between them. This ensures that there will be no multi-collinearity problems in the regression analysis.

[9] The INCOME variable is expressed in ordinal form on a scale of 1-7: 1 = up to € 10,000; 2 = € 10,001 - € 20,000; 3 = € 20,001 - € 30,000; 4 = € 30,001 - € 40,000; 5 = € 40,001 - € 60,000; 6 = € 60,001 - 100,000; and 7 = over € 100,000.

[10] The GEM project calculates the TEA (*Total Entrepreneurial Activity*) index as the percentage of the adult population (aged 18-64) involved in creating business undertakings that have been running for 3.5 years or less.

Table 2. Independent & dependent variables of the analysis. Encoding

Independent variables	
Variable Label	*Values*
EDUC_LEVEL	1 if the investor has a university-level qualification 0 otherwise
TEA	1 if the investor is also an entrepreneur in a business that has been running for less than 3.5 years. 0 otherwise
EXPECT	1 if the investor expects to start up a new business within the next three years. 0 otherwise
CLOSE-DOWN	1 if the investor has wound up a business undertaking (including self-employment) in the past 12 months. 0 otherwise
SKILLS1	1 if the investor considers him/herself to possess the skills and expertise needed to be an entrepreneur. 0 otherwise
SKILLS2	1 if the investor declares him/herself to have received specific training in starting up new businesses. 0 otherwise
RELAT_	1 if there is no prior link between the investor and the beneficiary of the funds, or if there is a purely professional or work-related link. 0 if there is a link based on family ties or friendship between the investor and the beneficiary of the funds.
INCOME	Average annual income of the investor.
INVEST_VOL	Average amount (in euros) invested in the business undertakings that they support as investors.
Dependent variable	
BUSANGEL	1 if the informal investor matches the profile for consideration as a business angel. 0 for other informal investors.

his/her life. The second is a subjective variable (SKILLS1) based on the investor's perception of whether he/she has the expertise and skills required to start up a business undertaking.

7. Results of analyses

The model reveals statistical significance in rejecting the null hypothesis based on the ratio of verisimilitude test (Sig = 0.000), which seems to indicate a better fit once the independent variables are incorporated into the model. On the other hand the lack of significance of the Hosmer-Lomeshow test (Sig = 0.642) means that the null hypothesis of no significant differences between observed and predicted classifi-

cations can be accepted: this confirms that the model specified fits the data correctly (see table 4).

Table 3. Variables analysed: descriptive statistics

	Business angel-type investors (n = 305)		*Other informal investors (n = 538)*	
	Mean	*St. Deviation*	*Mean*	*St. Deviation*
EDUC_LEVEL	0.49	(0.501)	0.41	(0.492)
TEA	0.12	(0.326)	0.07	(0.250)
EXPECT	0.23	(0.420)	0,19	(0.391)
CLOSE-DOWN	0.10	(0.299)	0,05	(0.225)
SKILLS1	0.87	(0.366)	0.64	(0.440)
SKILLS2	0.55	(0.499)	0.39	(0.488)
RELAT_	0.21	(0.406)	0,08	(0.274)
INCOME	3.78	(1.552)	3.30	(1.476)
INVEST_VOL	338,255.64	(3836806.18)	26,042.47	(193,148.51)

Table 4. Logistic regression: results for the model

Business Angel vs. Non-Business Angel						
Regressor variables	*B*	*SD*	*Wald*	*Gl*	*Sig.*	*Exp(β)*
EDUC_LEVEL	0,286	0,211	1,843	1	0,175	1,331
TEA	–0,261	0,356	0,536	1	0,464	0,770
EXPECT	0,226	0,253	0,797	1	0,372	1,253
CLOSE-DOWN	0,401	0,429	0,877	1	0,349	1,494
SKILLS1	0,830***	0,267	9,645	1	0,002	2,293
SKILLS2	0,359*	0,210	2,919	1	0,088	1,432
RELAT_	1,162***	0,314	13,706	1	0,000	3,198
INCOME	0,121*	0,068	3,175	1	0,075	1,129
INVEST_VOL	0,000	0,000	0,090	1	0,764	1,000
Constant	–2,315	0,419	30,470	1	0,000	0,099
Valid N = 466 Nagelkerke's R^2 = 0.114 –2Log of verisimilitude = 589.317			Chi-square = 42.305	gl = 9		Sig = 0.000
Hosmer & Lomeshow test			Chi-square = 5.871	gl = 8		Sig = 0.662

* p < 0,1; ** p < 0,05; *** p < 0,01.

Table 4 also shows the results of the logit regression model, in which it can be seen that some of the regressor variables identified have a significant influence on whether investors match the business angel profile. The estimated coefficient (β), the standard deviation of β (SD), Wald's statistic, the degrees of freedom (g), the sig-

nificance of the estimated coefficient (Sig.) and the odds ratio [Exp(β)] are obtained for each of the variables included in the model. The descriptive statistics (mean and standard deviation) of the various variables are shown in table 3.

To judge from Wald's statistic, the only significant regression coefficients are those that correspond to variables concerned with income level ($p < 0.1$), the type of relationship between investors and entrepreneurs ($p < 0.01$) and specific training in creating start-ups ($p < 0.01$; $p < 0.1$).

The higher the available income (INCOME) of an investor is, the more likely it is that he/she will be a business angel (Sig = 0.075). With a positive β coefficient (0.121) and an exponential value of β in excess of 1 ($e^{0.121} = 1.129$), it is found that business angels have higher annual incomes than the «other informal investors» group (for $p > 0.1$).

The type of relationship between investors and entrepreneurs (RELAT_) also proves to be significant, this time at the 1% level. With a positive β coefficient of 1.162 and an exponential value of β of 3.198 (> 1), it can be stated that when there are family ties or links of friendship between the investor and the entrepreneur the investor is more likely to belong to the «non business angels» group. However if there is a professional link or if there is no *a priori* kinship link between the parties the investor is much more likely to be a business angel.

Another significant relationship is found in regard to the possession of the skills required to create a start-up (SKILLS1 and SKILLS2 variables). Business angels claim to have higher levels of the knowledge and human capital required to be entrepreneurs (SKILLS1), and to have received more specific training in this regard (SKILLS2), based on the values of their β (0.830 and 0.359) and on their odds ratios in excess of one (2.293 and 1.492).

However, no significant link is observed ($p > 0.1$) in the cases of the following regressor variables included in the model: education level (EDUC_LEVEL variable), entrepreneurial experience (TEA, EXPECT and CLOSE-DOWN variables) and average volume of investment per project (INVEST_VOL variable).

To check the predictive ability of the model its accuracy rate must be tested by comparing the observed data from the sample with the predictions made. The confusion matrix or classification table shown in table 5 reveals that the model correctly classifies 22.6% of the informal investors with business angel profiles and 93.3% of non business angels. In overall terms this works out to 68.6% accuracy over the total number of original cases.

Huberty's test (e) was the performed to check whether this accuracy level is greater than the number of cases that would be correctly classified at random. This resulted in a Z^* statistic value, which was distributed as a normal distribution. For a 5% significance level a Z^* statistic value of 14.14 was obtained (so the null hypothesis is rejected) [11], so

[11] Ho: The number of cases correctly classified by the model does not differ from the classification expected due to the effects of random chance.

it can be stated that the accuracy rate provided by the model is significantly greater than would be obtained at random (see table 5).

Table 5. Results of the classification

Observed		*Forecast*		
		Do investors provide expertise & experience and involve themselves actively in the start-up that they fund?		
		Yes = Business Angel	*No = Other informal investors*	*% correct*
Do investors provide expertise & experience and involve themselves actively in the start-up that they fund?	*Yes = Business Angel*	38	132	22.6%
	No = Other informal investors	21	296	93.3%
	Overall percentage			*68.6%*
Huberty's test (e)				
$e = (1/487) * (170^2 + 317^2) = 265{,}68$		$Z^* = \frac{(334 - 265{,}68.87)\cdot\sqrt{487}}{\sqrt{265{,}68\cdot(487-265{,}68)}} = 6{,}22 > 1{,}96$		

8. Discussion of results

Our analysis of this logistic regression covers a number of independent variables or regressors and reveals how they affect the dichotomous dependent variable (1 = Business angel; 0 = Other informal investors). Our findings confirm that: i) the fewer links of kinship or friendship an investor has with the entrepreneur; ii) the higher his/her income level is: and iii) the more expertise and skills he/she has in regard to creating a start-up, the more likely he/she is to have a business-angel-type investor profile.

These findings confirm our hypotheses 2, 4 and 5. Unlike other informal investors, business angels are willing to bring money, time and experience to start-ups with high growth potential. The confirmation of hypothesis 2 corroborates the idea that the transfer of knowledge is based also on higher qualifications and more skills than other informal investors. This can be deduced from the finding that business angels are more endowed with the specific skills required for entrepreneurship and have more specific training in areas related to business start-ups.

The confirmation of hypothesis 4 shows that informal investors with higher income levels are more likely to belong to the business angel category. Mason and Harrison (2008) define angel investors as individuals with high purchasing power. They tend to operate portfolios of between two and five investment projects, though the high risks involved mean that they do not usually invest more than 10%-15% of

their net worth (Mason, 2006). However no significant differences can be observed in the average amount invested per project (which means that hypothesis 6 is rejected). This means that in Spain it cannot be said that business angels typically provide significantly more funding than other informal investors [12].

Funds linked to the 3Fs are highly important in funding start-ups. Once self financing (funds provided by the promoting team themselves) is exhausted the first external resources resorted to by entrepreneurs are usually those of their inner circle of personal friends and family. This is proximity financing, in which closeness to and prior confidence in a person are the sole guarantee or collateral demanded. However, business angels are associated by definition with investments made on the basis of more professional criteria, and although the capital that they provide is patient (flexible in terms of return rates and disinvestment schedules) it is also demanding in that it seeks high-quality projects with the potential for future growth.

The confirmation of hypothesis 5 bears out in part the contention that business angels are more rigorous and professional than other informal investors. This is demonstrated by the fact that they are found to invest less in projects run by people with whom they are linked by kinship or friendship. Logically, this means that the proportion of operations in which they have no prior proximity-based links with the entrepreneurs is greater: the investor/entrepreneur relationship is based rather on the professional setting of each project and its attractiveness as an investment opportunity in the relevant market.

As expected, it is therefore confirmed that investors who do not contribute expertise or experience to the projects that they finance (non business angels) mostly have ties of kinship or friendship with the entrepreneurs that they support. In other words, there is significantly less transfer of smart capital when investors belong to the category of the 3Fs.

In any event it must be pointed out that asymmetry of information sources makes it very difficult for investors and entrepreneurs to find each other, so it is not easy for investors to find attractive investment opportunities outside their immediate circle. However, more and more business angels are beginning to operate via platforms, networks or investment clubs that provide a way of accessing high-quality projects with high future growth potential outside their area of influence.

9. Conclusions

Business angels are individuals who invest their own money in start-ups and make an active contribution to the deployment of the relevant businesses by providing expertise, know-how, experience and their own networks of contacts. The main

[12] However, although the difference is not statistically significant, descriptive data reveal that the average investment made by business angels (€ 12,000) is higher than the average amount invested by the rest of the informal investment sector (€ 6,000).

advantage for entrepreneurs is that they invest at risk, with no demand for guarantees, and at the same time there is a transfer of «smart capital».

Business angels operate within the so-called «informal» venture capital market, a market characterised by its extreme heterogeneity. However, to date there has been little research into what profile or type of person is willing to invest his/her own wealth in businesses at the start-up stage.

A priori it seems clear that business angels represent a specific type of private investment. Their specific characteristics lead them to make contributions very different from the «proximity financing» provided by the 3Fs: they provide projects not only with funding but also with expertise, contacts, confidence and credibility in the eyes of third parties.

The findings of this study reveal that business angels tend to have higher income levels than other informal investors, and possess more skills relevant to creating start-ups. This is a positive finding in that it shows that the knowledge transferred to entrepreneurs is based on higher qualifications and skills on the part of investors. In other words, such investors are better trained, have more purchasing power and may be expected to base their decisions on more professional criteria.

It is essential for the figure of the business angel to be developed if the equity gap affecting start-ups at the outset of their projects is to be closed. This equity gap is especially difficult to bridge because the funding bracket involved is unattractive to venture capital funds, which generally prefer more conservative investment policies (less involved with early stage start-ups) and larger capital amounts.

The business angel market is subject to asymmetries of information, specific demand-related problems and limitations in its environment that affect its efficiency and its operation. There is therefore a need to set up networks that can help overcome some of these problems by providing a mechanism for matching investors with projects and acting as a preliminary filter to enable each investor to select the projects best suited to his/her interests. Such networks can also foster the training and preparation of entrepreneurs and investors and promote the development of programmes and seminars to increase public awareness of this type of financing.

Another important challenge for the business angel market lies in professionalising itself and increasing the volume of funding provided per operation. In this context syndicated and joint investment by more than one private investor may provide an innovative formula worth developing. This would also enable inexperienced business angels to work alongside more experienced investors, thus reducing risk levels in operations and giving rise to a learning effect that would also help professionalise the sector. Similarly, mixed operations by business angels and venture capital funds or subordinated public-sector loans would also help increase the coverage of the equity gap encountered in the early stages of start-ups.

Even so, it is clear that the business angel has become a figure of undoubted importance in the funding of entrepreneurial processes. This idea is supported by the fact that numerous public institutions have set up initiatives to support and encourage

business angels (networks, tax incentives, etc.). Moreover, in with current financial crisis banks have placed major constraints on lending, especially to start-ups, so angel financing may be the only way of securing funds to set up new projects.

10. Limitations and future research lines

The main limitation of this study lies in the sample selected. In accordance with the data used, and in line with the methods of the Global Entrepreneurship Monitor (GEM) project, the sample of informal investors and the subsample of business angels are obtained from the percentage of the adult population aged between 18 and 64 who have invested money in business operations run by others in the past three years. However, the facts show that business angels are frequently experienced professionals with entrepreneurial backgrounds who are now retired. Accordingly, failing to take 65 to 75-year-olds into account means excluding the significant proportion of business angels who are aged over 64.

To facilitate future research, further studies are required to clarify the heterogeneity of informal venture capital markets and analyse the idiosyncrasies of this type of investment. Specifically, it would be useful to study the behaviour of business-angel type investors, because their contributions in the form of smart capital (money + knowledge) make them key figures in helping entrepreneurs to bridge the equity gap and make up the shortfall in resources and skills from which they tend to suffer. Moreover, little is known about how entrepreneurs and investors first establish contact with each other, about what characteristics business angels rate highly when deciding whether to support a particular project or about the type of knowledge that they transfer to the start-ups that they support.

Future research could also examine the influence of the business environment itself in helping or hindering the development of informal venture capital markets. An analysis broken down by countries or regions would incorporate territorial variables and enable their influence to be measured in this regard.

Finally, the influence of the network effect could also be investigated: it would be worth analysing whether the intermediation of groups or BANs (Business Angel Networks) has any significant influence on the behaviour of investors in terms of project selection and post-investment contributions, or on the investment readiness of the entrepreneurs who resort to such platforms.

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