

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

<i>Indicator</i> 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) <i>Values from 0 to 200. Neutral value: 100</i>		91.2	84.9	93.4	57.3	64.0	65.9	74.9
Business Confidence Index (BCI) <i>Values from -100 to +100</i>		+7.2	+9.5	+9.0	-12.6	-19.0	-14.8	-9.2
INDSUP (Individual perception to entrepreneurship index) <i>Values from 0 to 3</i>	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) <i>Values from 0 to 3</i>	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%

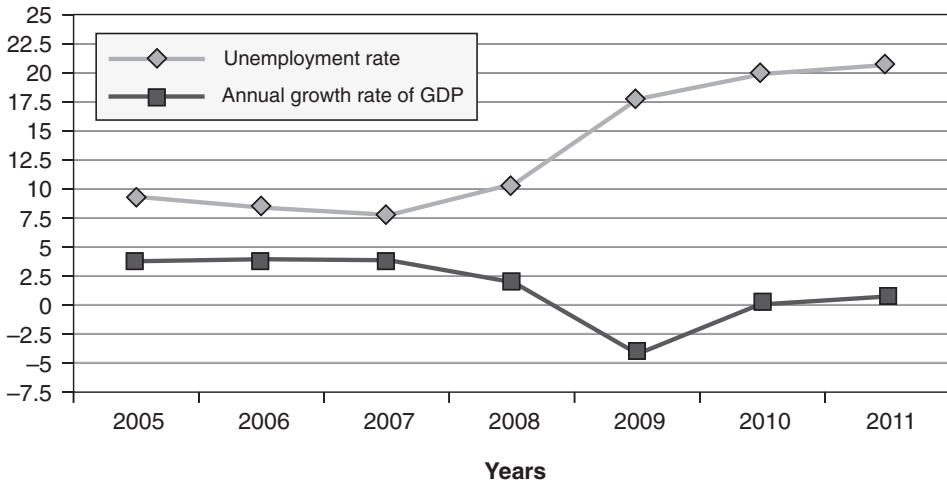
¹ The indicators on GDP, unemployment, CCI, and BCI are those registered in the second quarter of the years indicated so that they coincided in time with the dates the GEM APS survey was taken.

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; INDUSUP, 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.

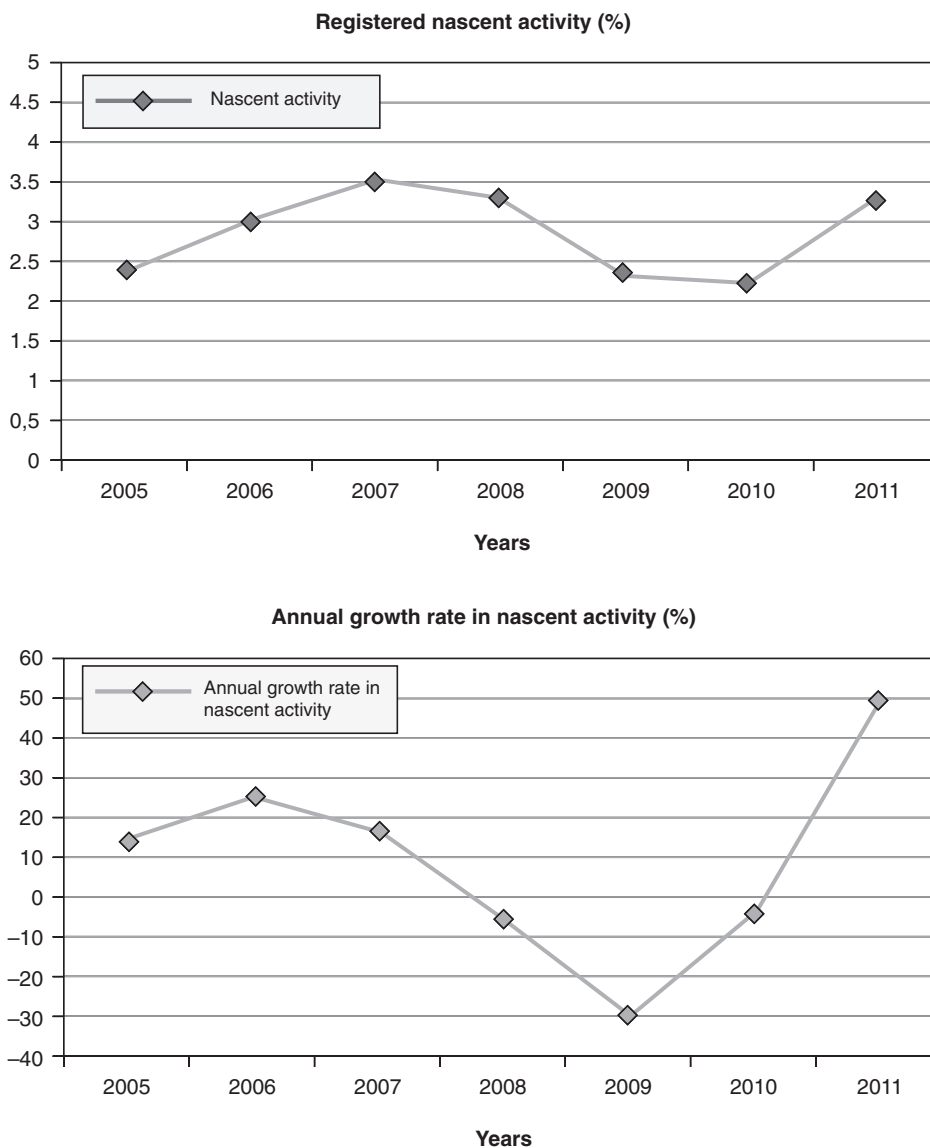
often they do not possess the necessary resources and skills. On a macro level, higher unemployment leads more to utilize self-employment as a way out; but then there is also less purchasing power on behalf of the population, and therefore, less demand, which in aggregate have a negative effect on the 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 involvement¹. 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-

ment, 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.

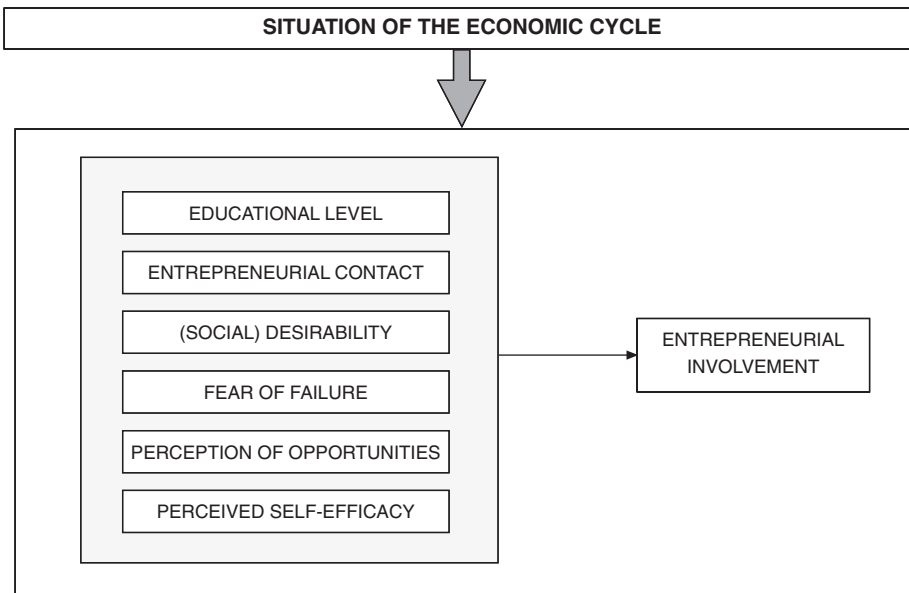
Perceived self-efficacy, an element highlighted by Shane (2003) as a psychological factor with influence on the aptitude for exploiting opportunities, is a variable centered on the individual that refers to the perception of one's capacity to execute and perform, and has been shown to be an element with 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 $\pm 0.82\%$.

The research focused on the study of nascent entrepreneurial activity², 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 test³ 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.

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 variable⁴ 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
	<i>Exp</i> (β) (SE)	<i>Exp</i> (β) (SE)	<i>Exp</i> (β) (SE)	<i>Exp</i> (β) (SE)	<i>Exp</i> (β) (SE)	<i>Exp</i> (β) (SE)	<i>Exp</i> (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 cases⁵. Additionally, the percentages of hits offer, for the optimal cutoff point in each case, a high predictive power for the nascent activity event⁶.

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

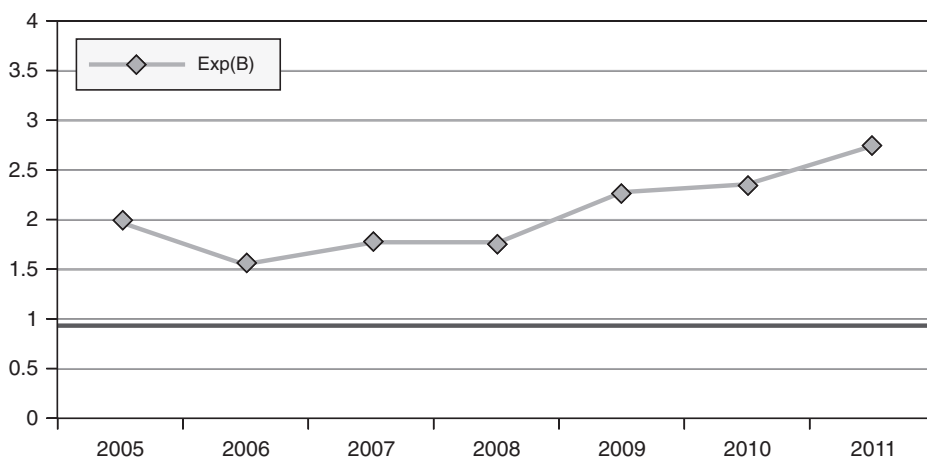
⁵ The graphic representation of all the possible cutoff points on two axes (sensitivity and 1-specificity) defines the ROC curve. The area under the curve (AUC) indicates, for all the possible combinations of pairs of individuals in which one shows the event but the other does not, the probability of 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

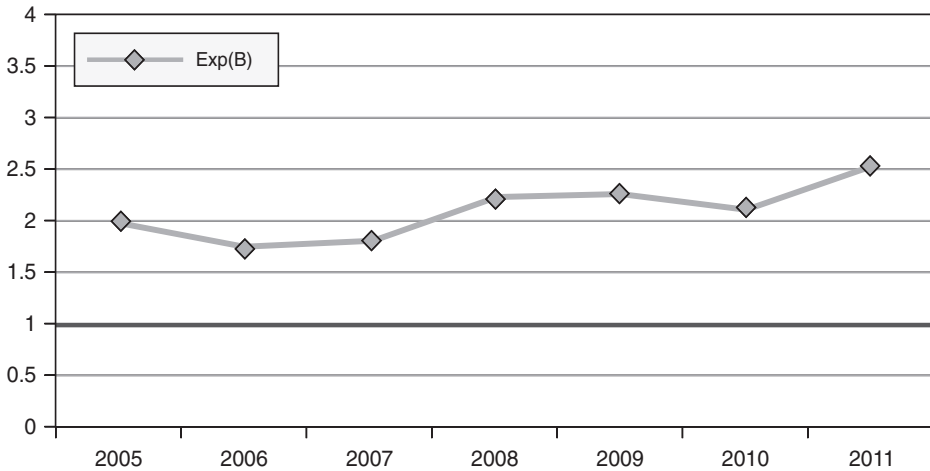


Source: Own elaboration.

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.

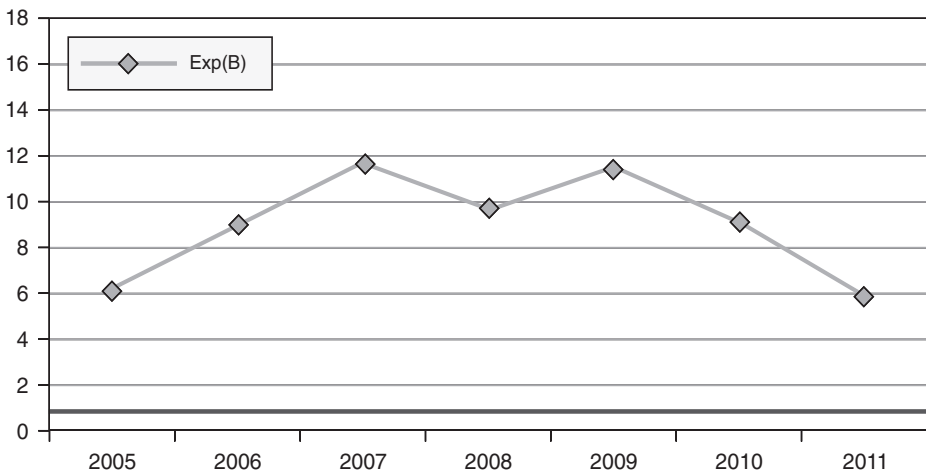
Figure 5. Odds ratio for perception of opportunities, 2005-2011



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.

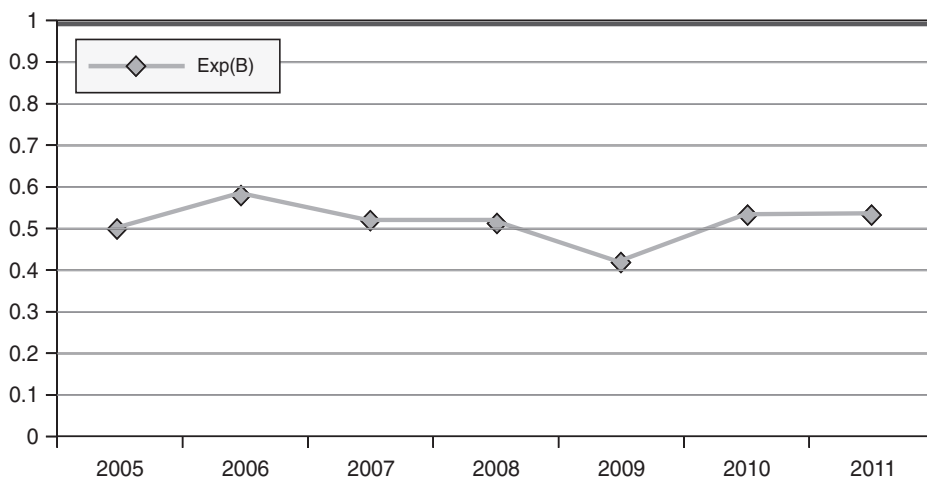
Figure 6. Odds ratio for perceived self-efficacy, 2005-2011



Source: Own elaboration.

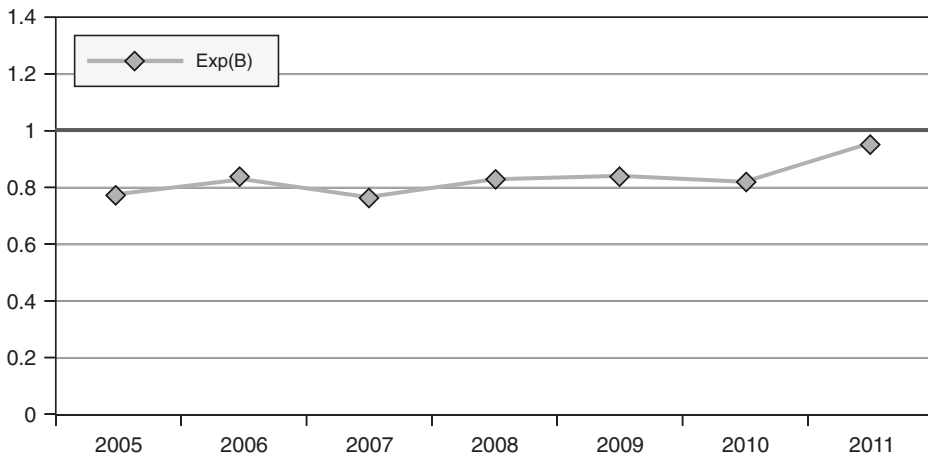
The perception of the fear of failure as a barrier maintains its negative influence, without significant differences, in such a way that entrepreneurial propensity can be reduced by approximately one-half regardless of whether the economic context is positive or negative in nature. This result could 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 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)

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

Table 4. (continue)

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