

EQUALITAS Working Paper No. 12

Determinants of Spanish Firms' Life Cycle and Job Creation:
A Pseudo-Panel Approach

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2012

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Abstract

This paper examines the role of human capital, individual entrepreneurial traits and the business environment on firms' life cycle and on job creation in Spain. For this purpose, we have constructed a pseudo-panel, by using the Global Entrepreneurship Monitor survey over the period 2001-2008. We have found that the creation, maturity and survival of firms were aided by the availability of bank credit and the large immigration inflows that Spain received over this period. However, of these two factors, only bank credit had a positive effect on the creation of jobs and on improving expectations of job expansion. The relatively high levels of youth unemployment experienced even before the crises of 2008 hurt the firm's chances of maturity and survival. The results also suggested that the gender gap in entrepreneurial activities had narrowed. In relative terms, women with higher levels of education were more likely to create mature firms than men. Based on the empirical findings and those of related literature, the paper offers policy recommendations to foster a sustainable entrepreneurial sector capable of contributing to the recovery of the Spanish economy.

Keywords: firm's life cycle; job creation; credit, immigration; pseudo-panel; instrumental variables.

JEL codes: D22; D92; O16; R23; C23; C26

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Introduction

Spain enjoyed a considerable period of economic growth from 1994 to 2007, characterized by extensive job creation.¹ During that period, unemployment rates decreased from nearly 23 percent to 8 percent in 2007, despite the sustained immigration flows which further expanded the labor force. This period of economic prosperity was aided by historically low interest rates and the expansion of credit facilities, which in turned helped with the growth of private consumption, investment and significant reduction of public debt (Andrés et al. 2009). Nonetheless, there were some evident imbalances. Growth was underpinned by a housing bubble, financed by cheap loans to builders and homebuyers. The labor market had severe degree of duality between permanent and temporary workers.² Those with fixed-term contracts having much lower severance payments than those on open-ended contract. Thus, the segment of highly flexible workers, mainly young people, carried the burden of labor market adaptation in the crises, accounting for close to 90 percent of the jobs lost (Estrada et al. 2011). Productivity did not grow as the economy was biased towards relatively low productivity sectors, in particular construction. As a result, the repercussions of the global financial crises were felt in Spain more intensively than in other countries. Unemployment rates more than tripled after the onset of the crisis and the bursting of the Spanish housing bubble. Currently, there are over five million people out of work, accounting for more than 25 percent of the labor force, a record high among industrialized countries (INE 2012). The economic crises has continued to worsen, combined with increasing public debt and a recent bank bailout, leaving the important pending questions of what Spain can do to foster the creation of jobs and the recovery of the economy.

Entrepreneurship has long been seen as one the key ingredients of job creation and development. But which factors make entrepreneurship succeed or fail, particularly in the Spanish context? According to an extensive review by Sánchez and Gutiérrez (2011), although the literature on entrepreneurship in Spain is an emerging field, it is rapidly growing. The focus has been on testing early theories that argue that personality traits, skills, educational attainment, and social resources such as belonging to social and financial networks make people more likely to succeed as entrepreneurs (Entrialgo et al. 2000; Lafuente et al. 2007; Sánchez and Gutiérrez 2011). By focusing primarily on the role of an entrepreneur's characteristics and their networks, other factors that might also significantly influence the chances of entrepreneurial success are overlooked, in particular those that go beyond the factors that entrepreneurs can control. For instance, businesses opportunities are largely influenced by market forces, thus the chances of entrepreneurial success are not necessarily determined by the

¹ For instance, Spain created 66 percent of all the new jobs available in the EU between 2005 and 2007. However, from mid-2007 onwards the rapid deceleration of the Spanish economy accounted for more than 35 percent of the unemployment levels in the EU (Fundación ideas 2011).

² According to Werner et al. (2012) before the crisis, one third of employees worked on a fixed-term contract and 85 percent of those working on a temporary contract did so involuntarily with as many as two-thirds holding a contract with a duration of six months or less, that is twice the EU-15 average.

qualities or profile of the entrepreneurs alone (Clydesdale 2008). In the Spanish literature, however, with a few exceptions, much less attention has been paid to the aggregate market factors that may promote or deter entrepreneurship. For instance, few studies have found that generalized increases in unemployment drives Spanish people into self-employment and the plans of business innovation and growth strategies are influenced by the regional context where firms are located (Cueto et al. 2012; García-Tabacuenca et al. 2010). Overall, these studies provide a picture of some of the factors that affect decisions to become entrepreneurs and their business plans, but there is still a gap in how the interaction between the individual characteristics and the opportunities available in the market place affect the overall firm's life cycle as well as job-creation. The purpose of this article is to bridge this gap.

This article has three main objectives. Firstly, to investigate which factors affect the creation, maturity and survival of businesses in Spain. Secondly, to analyze which factors affect the size of businesses, in terms of the number of employees hired, as well as examining expectations of job-expansion. Thirdly, with the purpose of providing a deeper understanding of these issues, we build a bridge between the individual, network and as well as aggregate contextual factors that might affect entrepreneurship and which could feed into the debate on how sustainable entrepreneurship could be encouraged as well as expanding the creation of jobs.

To explore our research questions, we use the publically available Spanish Global Monitor Entrepreneurship (GEM) adult survey over the period 2001-2008. We complement this survey with annual indicators of unemployment rates (disaggregated by age and gender), the immigrant population and the amount of credit provided by private banks over the period analyzed. Our interest is not only to assess whether unemployment drives people to engage in opening businesses, but whether businesses can actually manage to mature and survive. We also have an interest in analyzing the impact of immigration on the entrepreneurial sector. This interest lies in the fact that Spain has changed from being a net sender of migrants to become a net recipient of immigrants over the period in question. It now has the second largest immigrant population in the EU (Fundación Ideas 2011, p.22). Although there are a few studies suggesting that immigrants in Spain are more likely to engage in entrepreneurial activities than the native population (Arjona and Checa 2006, 2008; Corduras 2008), less is known as to whether on the whole the large immigration flows that Spain received have been positive for entrepreneurial activities in the context of high (youth) unemployment. At the aggregate level, we also explore the role of credit on firms' life cycle. Unfortunately the GEM survey does not ask whether the entrepreneur has requested or received a credit from a financial bank nor there are aggregate statistics on the credit given exclusively to entrepreneurial activities. So, we analyze instead the impact that the available credit in the economy had on firms' life cycle. Although it became clear after the crisis that much of credit had been targeted towards the housing sector, it is of interest to assess whether this credit actually contributed to the creation, and the maturity of businesses and job-creation; either directly or indirectly.

Our results indicate that there was a gender gap in the propensity to engage in businesses, although this gap narrowed over the period analyzed. On the one hand, men with low levels of educational attainment, defined

as completed secondary or less, were more likely to engage in nascent or early entrepreneurial activities than women. On the other hand, women with higher education levels were more likely to engage in entrepreneurial activities than men. This evidence is consistent with previous studies that show women have increasingly engaged into the Spanish labor market and entrepreneurial activities (Casteigts 2007). Although from our findings one might conclude that education has aided women in engaging with the entrepreneurial sector, other factors might have also contributed to this situation. For instance, women faced higher unemployment rates and earned lower salaries than men. Also the labor legislation has provided little support for combining work with family, and thus entrepreneurship might have provided women with a better alternative to badly paid employment.

We also found strong evidence that people with “entrepreneurial traits” are more likely to engage in business. These traits include believing they have the knowledge, skills and experience to open and run a new business, identifying business opportunities in the area and being embedded in an entrepreneurial network, measured by having recently met at least one successful entrepreneur. Our findings confirm the evidence of the role of informal networks theories, as those who have financially aided others to open a business, are themselves more likely to engage in businesses.

With regard to the influence of aggregate factors, we find that the large immigration flows that Spain received contributed positively to the creation, maturity and survival of firms, and did so by using banking credit available. However, credit also contributed further to the probability of firms creating more jobs and is expected to do so in the near future. With regard to unemployment we found a non-linear relationship with entrepreneurship. At low levels of unemployment, the probability of opening a business was reduced. However, as unemployment levels rose, more businesses opened but also less survived.

Overall, the article contributes to the literature in the following way. Firstly, we assess the extent to which individual, network and aggregate factors affect the dynamics of entrepreneurial activities. Based on our empirical findings and others from the related literature, we identify a number of policy measures for fostering the entrepreneurial sector and job creation in Spain. Another contribution of the paper is the use of pseudo-panel econometric approach. Although the GEM survey offers a rich source of information, one of its potential drawbacks is that a new random sample of individuals is collected each year, limiting the ability to study the decision that same individuals make to become or remain entrepreneurs over time. To overcome this limitation, we construct a pseudo-panel of cohorts of people based on their age and gender, and thereby we are able to track generations over time and estimate their entrepreneurial decisions. We also use instrumental variables to deal with the likely endogeneity of exploring the influence of unemployment rates on entrepreneurial activities.

The article proceeds as follows. Section two presents the hypotheses on the factors that might have influenced the firm’s life, job creation and its expectations of expansion in Spain. In section three we describe the datasets and in section four the pseudo-panel methodology which we have used. Section five presents the econometric results. Section six discusses the policy implications of our findings, and section seven concludes.

2 What makes an entrepreneur and drives job creation? Theory and hypotheses

There has been a long debate in the literature about what influences people to become entrepreneurs. Various theoretical frameworks have been proposed and tested. On the one hand, several authors have found support for theories which suggest that socio-cultural factors, role models, networks and institutions are important factors in aiding people to become entrepreneurs (North 1990; Uhlander and Thurik 2004; Veciana 1999). On the other hand, conventional psychological and economics theories have also found empirical support in that decisions to become an entrepreneur may be based on the individual's preferences and traits, the expected returns of alternative occupations, access to credit as well as regional and national economic conditions (Knight 1971; Mortensen 1986). The inter-play among these individual, network and market factors influences the level of entrepreneurial activities and how they evolve over time, although there has been much discussion as which theoretical framework is more important than the other in explaining entrepreneurial decisions (Lafuente et al. 2007; Veciana 1999).

According to Clydesdale (2008) all the socio-economic and network entrepreneurial theories share the assumption that people with certain characteristics are more amenable to open and manage their own businesses, a focus which is compatible with the Schumpeterian view of entrepreneurs as people who can mould market conditions and create opportunities that previously did not exist. Not surprisingly, many studies stress the personal qualities that help people become entrepreneurs, such as willingness to work hard for long hours and flexibility (Light 1979; Waldinger et al. 1985) thereby ignoring other aggregate factors. More recently, some studies have seen entrepreneurship as the interaction between individuals and opportunities in the market place (Clydesdale 2008; Engelen 2001; Shane and Eckhardt 2003). These studies put forward the argument that, since entrepreneurs do not operate in a vacuum but are constrained and empowered by the market forces and institutional settings, these factors should also be taken into account.

Each of the theoretical frameworks mentioned involves proposals for several factors which influence the decision of entrepreneurs to expand their firms by hiring more employees. Psychological and socio-economic theories suggest that the managerial abilities of an entrepreneur to organize production, obtain credit, discover and exploit businesses opportunities are crucial in deciding whether to expand (Venkataraman 1997). The existence of role-models and support networks can also be advantageous. The conventional economic literature suggests that entrepreneurs decide whether to hire more employees, depending on the expected profitability of job-expansion and survival of the firm. This will depend on the current conditions of the market and expectations about the demand for a firm's product in both the short and long term. Meanwhile, a number of institutional theories suggest that a firm's decision to expand is influenced by the regulatory framework of hiring or firing people, particularly in Spain, as it affects how easy is for firms to adjust in size to the always changing economic conditions and, the level of unemployment in the economy, thereby reducing salaries and the size of the market (Andrés et al. 2009).

In the rest of this section we draw on a set of six hypotheses, taken from the various theoretical frameworks mentioned, regarding what affects firms' life cycle and job creation. Our aim is not to assess which theoretical framework is more important than the other, but to assess how the existing theories help to explain entrepreneurial activities and how these have evolved in Spain. But before we continue setting these hypotheses we need to clarify what we mean by entrepreneurship and what stages of entrepreneurial activity we study in this article.

We use the same definition of “entrepreneurs” as the one proposed by the GEM network, that is “*adults in the process of setting up a business they will (partly) own and or currently owning and managing an operating young businesses*” (Reynolds et al. 2005, p. 209). As in the GEM network, we study four stages of entrepreneurial stages. First are the *nascent entrepreneurs* who are actively involved in setting up a businesses they will own or co-own, but this business has not paid salaries, wages or any other payments to the owners for more than three months. At the second stage are the owners-managers of *young firms*, defined as having paid salaries for more than three months and less than 3.5 years. In the third stage are those who have paid salaries or wages for more than 3.5 years, and are considered *established firms*. The fourth and last stage consists of those who, in the past 12 months, have sold, shut down, discontinued or quit a business. In figure (1) we illustrate how the proposed hypotheses might affect firms' life's cycle, in terms of what we may call firms' creation, maturity and death, as well as the decision to create jobs.

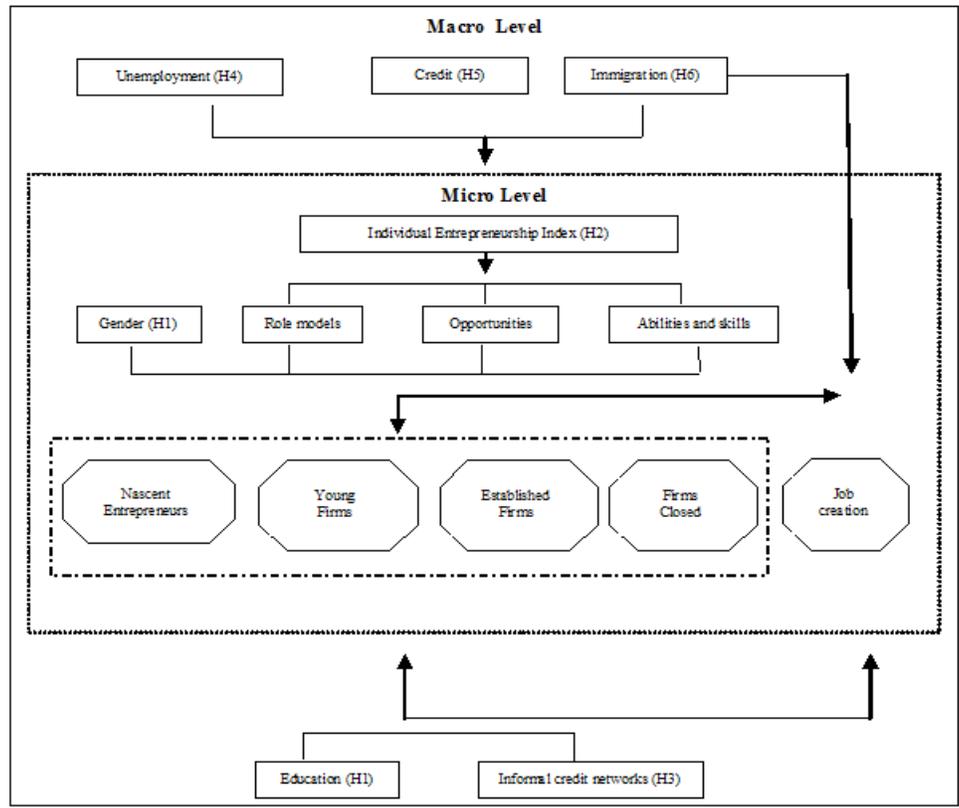


Figure 1 Hypotheses affecting firms' life cycle and job creation

The first hypothesis considered is about the role of education and gender in entrepreneurship. The degree to which women engage in entrepreneurial activities has been found to be dependent on their participation in the labor market, the support received from institutions, access to credit and role models (Driga et al. 2009). In industrialized countries though, women are still less likely to engage in entrepreneurial activities than men (Driga et al. 2009; Reynolds et al. 2004), and there is indeed evidence of that in Spain (Lafuente et al. 2007). In most European countries there is little evidence that the gender gap in entrepreneurial activities is narrowing (Franco and Winqvist 2002). There are, however, some exceptions such as Italy, a country with a similar segregated labor market to Spain, where the gender gap in opening businesses has narrowed, and the failure rates of firms owned by women are much lower than those of men (Lotti 2006). In Spain, some fundamental changes were made during the period being analyzed that might have increased the chances of women becoming entrepreneurs. Firstly, over the past three decades the Spanish government has narrowed the gap in educational attainment among the population. The education attainment is still below of that of the OECD average, and while there are higher desertion rates, women have benefited by having more access to education (Prats et al. 2005). Higher levels of education, along with the increase in divorce and reduction in birth rates, and the arrival of immigrants that took over the jobs traditionally destined to women, such as domestic activities and services, all contributed towards the incorporation of women into the labor market (Casteigts 2007; Fundación Ideas 2011). For instance, between 2000 and 2010 the women's activity rate increased by 23 percent, in contrast to the male rates, which increased by only 3 percent. Thus, over the same period, 85 percent of the new active labor force population were women (Fundación Ideas 2011). Nonetheless, given the gender-bias characteristics of the Spanish labor market and limited support towards combining work with family, we hypothesize that women, especially the more educated ones, might have had greater incentives to open businesses than men.³ This is especially true the type of firms analyzed in this paper, as the majority (80%) were small, with five or less employees (see table A.1 in appendix). We specifically hypothesize about women with higher education levels, as education is also a proxy for wealth, and funds are available for engaging in entrepreneurial activities. Furthermore, the network literature highlights the fact that the more education people have, the easier they will find it to open and run their own business successfully, as education brings out two fundamental tools. On the one hand, education provides information and access to networks which aid in the discovery and take up of business opportunities such as alumni contacts and access to formal credit sources (Cohen and Levinthal 1990; Burt 1992). On the other hand, higher education levels are associated with the managerial abilities needed to operate a firm and seize businesses opportunities (Krueger 1993, Shane and Venkataraman 2000). Thus, we set the first hypothesis as follows:

³ For instance, the highly segregated labor market offers women lower salaries than men, limited benefits for maternity leave, and have higher unemployment rates than men for every single age bracket (Casteigts 2007).

H₁: Women with higher education levels are more likely to start, develop, survive and expand their businesses than men.

The ability to notice and act upon identified business activities has been associated in the literature to various factors, what we call an ‘entrepreneurial trait’. According to the psychological and network literature, these factors include people’s ability to notice business opportunities, as well as having the personality and skills necessary to become entrepreneurs. These skills include having confidence, and managerial and organization proficiency (Arenius and De Clercq 2005; Arenius and Minniti 2005; Baron 2000). However, people who might have the necessary skills and who might notice business opportunities will not necessarily act upon becoming entrepreneurs. Knowing that having successful entrepreneurs can make a difference, may make people that might have not contemplated it before take up business as a career choice (Johannisson 1988; Shane 2000). Noticing and imitating the actions of successful people is referred in the literature as role model theory (Borjas 1986; Slater 1961). This theory has been tested using the GEM survey findings for general empirical support (Fornahl 2003; Gibson 2004; Johannisson 1998, Klyver et al. 2008; Krueger and Brazeal 1994). Thus, we hypothesize that people who have such entrepreneurial traits who is not only will be more likely to open and manage their own business, but will also have the ability, confidence and role models necessary to expand their business as a career choice. We construct an index to quantify the strength of these entrepreneurial traits and role models. The index takes the value of zero if the person self-reports not to have the skills to open a business, does not see business opportunities in areas and has not met any successful entrepreneurs over the last year. The index takes the value of three if it has the three characteristics. Thus we hypothesize:

H₂: The greater the index of entrepreneurial traits people have, the more likely it is that they will start develop and expand their businesses.

The decision to actually keep a business afloat and expand will depend of course, on whether people have the financial means to do so. Evidence gathered from the developed world has shown that people’s needs and use of credit networks varies in different stages of entrepreneurship (Johannisson, 1998, Klyver et al., 2008). Although informal credit networks provide resources at any stage of entrepreneurship, they have been found to be particularly important in the early phase of business life (Greve and Salaff, 2003; Mason and Harrison, 1995, 2002). Similar results were also found in Spain by using the GEM survey (Gúemes and Corduras, 2010). Small prospective entrepreneurs and people with low levels of assets or no formal credit history typically represent a risk that is too high or a non-profitable venture for formal credit sources such as banks (Freear et al. 1994). Thus, people who are credit-constrained from formal sources have to gather “seed capital” from informal credit networks, such as family, friends and informal investors; also known as “business angels” in the literature (Davidsson and Honig, 2003; Sørheim, 2003). In contrast, in the consolidation phase of the firm, entrepreneurs extend their credit networks and enjoy greater access to private banking and public funding, thus the role of informal financial networks is reduced. Unfortunately, for the period being analyzed, the GEM survey does not provide information as whether people have requested support from credit networks. Nonetheless, there is

information about whether the survey respondents are informal investors and if they have provided credit to others for the purpose of business activities. Informal investors are likely to be embedded in entrepreneurial networks, have such tolerance for risk that are willing to help others to engage business activities, factors which in turn will make these informal investors more likely to be involved in businesses themselves. However, the literature has also found individuals who rely on informal credit networks might be prone to business failures as these informal networks tend to overcompensate for other underlying shortcomings, such as lack of access to formal credit markets which reduces the chances of taking more profitable investments (Brüderl and Preisendörfer, 1998). Thus we hypothesize that:

H₃: Informal investors are more likely to engage in the start up and new businesses, whilst less likely to engage in matured businesses and survive.

We now move to set the hypotheses concerning aggregate factors. We begin by considering the role of available bank credit. As discussed above, access to credit is fundamental for the take up of business activities, survival and continuous expansion. During the period analyzed Spain had increasing levels of credit available from formal sources and historically low interest rates that might have enabled people to take up credit for business activities. After the crises, it became evident that much of that credit had been targeted towards the construction sector (Andrés et al., 2009). Although there are no statistics as what percentage of the available credit was actually targeted towards business and in which sector, we expect that that the overall credit available in the economy helped business as it expanded the power of private consumption and the size of the market. Thus we hypothesize as follows:

H₄: The availability of credit affected positively the start up, maturity, survival and job-expansion of businesses.

We continue with the role of levels of unemployment. In the literature there is ambiguity as to what the impact of unemployment on entrepreneurial activity and businesses expansion may be. Bergmann and Sternberg (2007) argue that, on the one hand, unemployment offers people greater incentives to open their own businesses. If unemployment is also associated with having low salaries, established entrepreneurs might be also encouraged to hire more people. On the other hand, if unemployment levels are not idiosyncratic for a few groups of people, but extensive in society, this means that the aggregate demand will be low; thereby having a negative impact on the expected returns from entrepreneurial activity and that there will be fewer chances to open new business or expanding and a higher risk of business closure. So the overall influence of unemployment levels on business formation and expansion is indeterminate (Armington and Acs, 2002; Storey, 1994). Given the high levels of unemployment that Spain experienced compared to the EU average, especially among women and the youth, we set hypothesis 5:

H₅: Unemployment positively affects the start up of firms, but reduces the chances of the development, survival and expansion of businesses

When testing hypothesis 5, we will deal with the likely endogeneity between unemployment and entrepreneurial activities. On the one hand it is possible that high levels of unemployment will drive people to engage in entrepreneurial activities, but as they do so, the unemployment rate will be affected, thus creating feedback between both variables.

Our last hypothesis regards the role of immigration. The literature has in general found that immigrants are more likely to engage in business activities than the native population. Nonetheless, since the growing immigrant flows in Spain still represent a small group compared to the rest of the population, our interest is to assess whether immigration as a whole contribute positively to firms' life cycle and the creation of jobs. We hypothesize that immigration benefits businesses and their expansion through three main channels. Firstly, immigrant flows can enable firms to hire both skilled and cheap labor. Secondly, although immigration may have also displaced the native population, no evidence has been found this occurring in Spain (Carrasco et al., 2008). In fact, studies suggest that immigration in Spain, as well as in other European countries, complements the activities of the native population (Amuedo-Dorantes and De la Rica, 2009; D'Amuri and Peri, 2010). For instance, immigration enables women and members of the native population to reduce their contribution to traditional sectors, such as construction and agriculture. Thus, the native population moves to better paid sectors, thereby increasing the size of the market and the profitability of businesses. Thirdly, some studies have also found immigrants in Spain who are more likely to open businesses than the native population (Corduras, 2008) as at their arrival they encounter a segregated labor market offering them a lower salary than that of the natives, despite often having higher levels of education (Arjona and Checa; 2006, 2008).⁴ Thus it can be hypothesized that:

H₆: Immigration flows positively affect the start up, development, survival and expansion of businesses.

Having described the six hypotheses that will be tested in section five, we move next to describing the survey and indicators used.

3 GEM Survey

The Global Entrepreneurship Monitor (GEM) is the largest survey of entrepreneurial activity in world, covering 85 countries so far. In order to measure the dynamics of entrepreneurial activity in Spain, we focus on the Spanish GEM survey over the period 2001-2008. This survey has been conducted annually through random telephone interviews stratified by region to represent the adult population.

GEM's primary objective is to estimate the incidence of individuals involved in entrepreneurial activities at a single point of time. In total, 129,445 individuals have been interviewed in Spain over 2001-2008.

⁴ For instance, according to a survey on structural salaries conducted in Spain in 2008, immigrants from EU countries received on average 22 percent lower salaries than natives, and this gap was even wider for non-EU immigrants, 36 per cent (Fundación Ideas, 2011, p. 51).

Of these, 3,626 were engaged in nascent entrepreneurship, 4,742 in young firms, 9,785 in established firms and 1,638 who had recently have closed their firm. Figure (2) shows the evolution of these various states of entrepreneurship. The rate of nascent and young firms increased particularly from 2004 to 2007. The onset of the economic crises in 2008 reduced the rate of creation of firms and accelerated the rate at which firms died. The GEM micro-surveys for 2009 onwards are not publically available yet, hence were not used in the econometric analysis of this article. However, some of the aggregate statistics for these years have been released, which shows a further deterioration of the rates of entrepreneurial activities and a slight recovery by 2011.

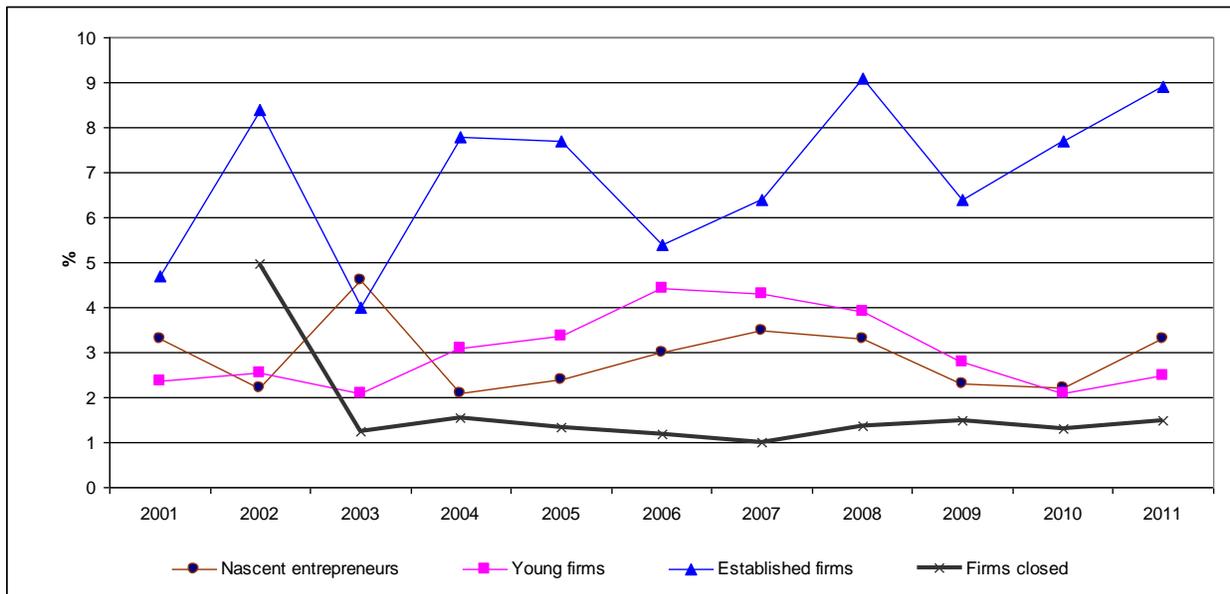


Figure 2 Rates of entrepreneurial stages

Source: GEM 2001-2011.

The expansion of entrepreneurial activity over much of the period analyzed was also driven by the increasing participation of women. In table (A.2) we show the proportion of nascent, young and established firms by gender and education level. We cannot produce information for 2001 since for that year data on education were not available for that particular year. However, the table shows that in all the stages, the gender gap in entrepreneurial activity narrowed from 2002 to 2008, especially for those with a high school education. The rates of businesses failure remained fairly the same by gender and over the period analyzed, there was however an extremely high level of businesses failure for women in the year 2003, which is likely to have been a matter of sampling representativeness of business failure.

With regards to size of firms, about eighty percent of the firms captured by the GEM survey are small, consisting only of up to 5 employees. As shown in table (A.1), the size of the firms is consistently small across the different stages of entrepreneurship analyzed. The size of the firms also remained small throughout the

period analyzed. One might disregard these firms as not being significant for the creation of jobs, and evidence from other countries suggests that the net job creation rate is clearly negatively correlated with employer size. In other words, smaller business establishments have higher net job creation rates than bigger ones (Birch, 1987; Neumark et al., 2008).

Although the GEM survey offers a rich source of information about entrepreneurial activities, one of its potential disadvantages is that a new random sample of individuals is collected each year. Thus we do not follow the *same* individuals over time as in pure panel surveys. Not having panel surveys limits our ability to study the decision that *same* individuals make to become or remain in entrepreneurial activities over time. To overcome this limitation, we construct a pseudo-panel of cohorts of individuals with a fixed membership over time: gender and year of birth. Under this approach, we are able to track generations of people over time and estimate entrepreneurial decisions based on cohort means rather than individual observations. If there are enough observations per cohort, as we have, then the repeated surveys overtime generate a longitudinal dataset that can be used to infer behavioral relationships for the cohort as a whole, just as if pure panel surveys were available (Deaton 1985). Another advantage of using a pseudo-panel is that because new samples are drawn each year, representativeness remains constant and attrition bias is avoided, a problem often common in pure panel surveys.

4 Econometric Specification: Pseudo-Panel

To begin, we estimate a series of pseudo-panel regression models to analyze which individual, network and macro factors affect the probability of being in the various stages of entrepreneurship. In these models, the dependent variable is at a specific stage of entrepreneurship, which could be either one of the following: nascent entrepreneur, young firm, established firm or having closed a firm over last year. The independent variables used are expressly those set to test the hypotheses described. Following the notation of Baltagi (2005), in equation (1) we illustrate the basic idea involved in constructing the pseudo-panel. There is a set of T independent cross-sections of i individuals that belong to a new and most likely different set of N individuals in each period. Where y_{it} denotes whether the individual is engaged in an entrepreneurial stage or not, x_{it} denotes a vector of explanatory variables, μ_i individual-specific time-constant unobserved heterogeneity and an unobserved idiosyncratic error v_{it} that varies over individuals and over time.

$$y_{it} = x_{it}\beta + \mu_i + v_{it} \quad i=1,\dots, \quad t=1,\dots,T \quad (1)$$

If the individual effects μ_i are uncorrelated with the vector of explanatory variables x_{it} , then equation (1) could be estimated consistently by pooling all the observations from a repeated cross-section and performing ordinary least squares. In this case $\mu_i + v_{it}$ would be treated as the composite error. However, in many instances, the individual effects are correlated with some or all of the explanatory variables, so that the least ordinary squares would lead to biased and inconsistent estimates if using pooled-cross sections data. To solve this

problem, Deaton (1985) proposes using cohorts, thereby building a pseudo-panel, which leads to consistent estimators of β even when the individual effects are correlated with explanatory variables.

To construct such a pseudo-panel, we define a set of C cohorts, each with a fixed membership that remains constant throughout the entire period of analysis and whereby each individual observed belongs to one and only one cohort. Then by averaging the observations over individuals in each cohort we obtain equation (2), which produces a pseudo-panel with repeated observations over C cohorts and T periods.

$$\overline{y_{ct}} = \overline{x_{ct}}\beta + \overline{\mu_{ct}} + v_{ct} \quad c=1,\dots,C \quad t=1,\dots,T \quad (2)$$

The bars in equation (2) denote the average value of all individuals in cohort c at time t . Because we are concerned with a discrete choice of whether the individual is involved in entrepreneurial activity at time t , the averaging of the binary dependent variable leads to this being interpreted as the proportion of individuals involved in entrepreneurial activities in the cohort c at time t .

An important distinction in equation (2) is that the average individual error, $\overline{\mu_{ct}}$, varies over time, given that is averaged over a different individuals belonging to cohort c at a time t . Hence is very likely that $\overline{\mu_{ct}}$ will be correlated with x_{ct} and that a random specification will therefore lead to inconsistent estimates. On the other hand, treating $\overline{\mu_{ct}}$ as a fixed effect can lead to an identification problem, unless it is assumed that the individual error is time invariant, that is $\overline{\mu_{ct}} = \overline{\mu_c}$. This assumption seems reasonable if the cohort averages are estimated over a large number of observations. Verbeek and Nijman (1992; 1993) find that if each cohort is greater than 100-200 observations, then the cohorts will be large enough to eliminate the bias. In this case $\mu_{ct} \approx \mu_c$, and equation (2) can be estimated using cohort dummy variables; that is using μ_c instead of μ_{ct} yielding unbiased estimators. To ensure that the estimators are also efficient, one must control for the likely problem of heteroskedasticity, which could occur if the number of observations per cohort varies substantially. To correct for such issue it is recommended to use weighted least squares (WLS) estimation, as we do here, by weighting by the square root of the number of observations in each cohort (Dargay 2007).

We have defined the cohorts in terms of gender and year of birth, as these are observable and do not change over time. Specifically we have eight time periods (2001-2008) and 10 cohorts in each. Five of these cohorts are for males, and five for females. Within each gender we further defined five cohorts of age: those who were in 2001, 28 years old or less, 29-38, 39-48, 49-58 and 58 or over. Then those cohorts are followed up over time. For instance, individuals are considered to belong to the first cohort of age if they were aged 28 in year 2001, 29 in 2002, 30 in 2003 and so on. We made the distinction in cohorts by gender and age as the literature has found evidence of the probability of being engaged in entrepreneurial activities differs considerably with regard to these two variables.

The cohort structure used here allows for explicitly recognizing the nature of firms' life-cycle. Furthermore, pseudo-panels also allow other macroeconomic variables to be added, linking the micro and macro

factors that affect entrepreneurship. In particular, aggregate data that is the same for all cohorts but varies with time can be added, as well as other relevant data on the cohorts themselves (Deaton 1985). We have complemented the pseudo-panel with immigration population, unemployment rates and contributory unemployment benefit rates⁵, both disaggregated by age and gender, gathered from the Spanish Institute of Statistics, INE. We took the data on credit available from private banking, and exchange rates for euro/dollar from the Spanish Central Bank. In table (A.3) we report the sample size for each cohort, whereas in table (A.4) we present the basic descriptive statistics of the pseudo-panel and other aggregate indicators used. In table (A.5) we report the correlation matrix of among all the dependent and explanatory variables used, which show we have no problems of multi-collinearity.

5 Econometric Results: Firm's life span and Job creation

5.1 Firms' life cycle

In this sub-section we test our six hypotheses with regard to the impact of individual, network and macro factors on the Spanish firms' life cycle. The estimates from the pseudo-panel are presented in Table (1). The dependent variable in each of the models used are the proportion of people engaged in each of the stages of entrepreneurial activity by cohort. In column (1) we show the results for the nascent enterprises, columns (2-3) the ones for young firms, column (4) those for established firms and last column (5) the ones for firms that closed over last 12 months.

All the coefficients presented in this sub-section and the next one were estimated by using instrumental variables needed to deal for the likely endogeneity between unemployment rates and the entrepreneurial activities. The instrumental variables used were the contributory unemployment benefits (that vary by age, gender and over time) and year dummies. Other models were estimated using other instruments (such as cohort dummies and the exchange rate of the euro over the period analyzed) and not by using instrumental variables. All the models yielded very similar results, in terms of magnitude and sign of coefficients, to those presented here. As suggested in the literature, the standard errors were corrected for heteroskedasticity by weighting by the square root of the number of observations in each cohort. We will move next to present the results.

To test hypothesis 1, we used a two-way interaction between gender and education. Adding this interaction term changes the way in which the dummy coefficients of male and high school should be interpreted. If there were no interaction term, the coefficient of high school would be interpreted as the effect of having high school versus secondary on engaging in entrepreneurship. If an interaction term is added, then it indicates that the unique effect of high school on entrepreneurship is not limited to its coefficient, and that the effect of high school also varies by gender. Thus, the dummy coefficient for the male variable should not be

⁵ Obtained from PRD4 at <http://www.empleo.gob.es/estadisticas/BEL/PRD/indice.htm>

interpreted as the difference in entrepreneurial activities between males and females, but for exclusively those with secondary level or less. The coefficient for high school shows the difference between having high school or secondary or less but exclusively for females.⁶ Meanwhile, the interaction coefficient measures whether the effect of high school on entrepreneurial activity varies between males and females. Only if this interaction coefficient is statistically significant should it be included in the model.

Table 1 Pseudo-Panel: Stages of Entrepreneurship

| | Nascent entrepreneurs | Young firms | | Established firms | Firms closed |
|--|-----------------------|----------------------|----------------------|----------------------|----------------------|
| | IV | IV | | IV | IV |
| | (1) | (2) | (3) | (4) | (5) |
| Male | 0.011*** (0.001) | 0.023*** (0.000) | 0.022*** (0.000) | -0.011*** (0.001) | -0.005*** (0.000) |
| Education high school or more | 0.048*** (0.002) | 0.015*** (0.001) | 0.015*** (0.000) | 0.092*** (0.002) | 0.003*** (0.001) |
| Male*Education high school or more | -0.045*** (0.001) | -0.001 (0.001) | | -0.098*** (0.002) | -0.057*** (0.001) |
| GEM individual entrepreneurial index | 0.016*** (0.001) | 0.007*** (0.000) | 0.007*** (0.000) | 0.050*** (0.001) | 0.029*** (0.000) |
| Provided credit to network over last three years | 0.456*** (0.017) | 0.443*** (0.010) | 0.453*** (0.011) | 0.170*** (0.025) | 0.160*** (0.008) |
| Log(Credit) | 0.023*** (0.002) | -0.018*** (0.001) | -0.018*** (0.001) | 0.044*** (0.002) | 0.061*** (0.001) |
| Log(Unemployment rate by age and gender) | -0.330*** (0.014) | -0.144*** (0.007) | -0.158*** (0.009) | 0.897*** (0.023) | 0.022*** (0.005) |
| Log(Squared unemployment rate by age and gender) | 0.077*** (0.003) | 0.029*** (0.002) | 0.032*** (0.002) | -0.191*** (0.005) | 0.004** (0.001) |
| Proportion of immigrant poblation | 0.002*** (0.000) | 0.003*** (0.000) | 0.003*** (0.000) | 0.007*** (0.000) | -0.010*** (0.000) |
| Cohort (Male aged 16-28 reference group) | | | | | |
| Male 29-38 | -0.000 (0.000) | -0.008*** (0.000) | -0.008*** (0.000) | 0.092*** (0.001) | 0.016*** (0.000) |
| Male 39-48 | -0.009*** (0.000) | -0.024*** (0.000) | -0.024*** (0.000) | 0.113*** (0.001) | 0.015*** (0.000) |
| Male 49-58 | -0.023*** (0.001) | -0.038*** (0.000) | -0.038*** (0.000) | 0.139*** (0.001) | 0.019*** (0.000) |
| Male 58-64 | -0.025*** (0.001) | -0.048*** (0.000) | -0.048*** (0.000) | 0.116*** (0.001) | 0.030*** (0.001) |
| Female 16-28 | -0.033*** (0.001) | 0.010*** (0.001) | 0.009*** (0.001) | -0.049*** (0.002) | -0.042*** (0.001) |
| Female 29-38 | -0.012*** (0.001) | 0.013*** (0.000) | 0.013*** (0.000) | -0.031*** (0.001) | -0.029*** (0.000) |
| Female 39-48 | -0.010*** (0.000) | 0.006*** (0.000) | 0.006*** (0.000) | -0.010*** (0.001) | -0.023*** (0.000) |
| Female 49-58 | -0.004*** (0.000) | -0.003*** (0.000) | -0.003*** (0.000) | 0.005*** (0.000) | -0.010*** (0.000) |
| Female 58-64 | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) |
| Constant | 0.133*** (0.025) | 0.318*** (0.011) | 0.333*** (0.013) | -0.684*** (0.037) | -0.568*** (0.013) |
| R-squared | 0.390 | 0.810 | 0.798 | 0.660 | 0.477 |
| Number of observations | 127429 | 127429 | 127429 | 127429 | 127429 |

Significance Level * $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$.

Robust standard errors clustered are corrected by heteroscedasticity in parentheses.

Instrumental variables are used to deal with the endogeneity in the unemployment variables.

The instruments used are unemployment insurance rates, which vary by age, and year dummies.

As shown in Table 1, overall the findings support hypothesis 1. The interaction term is statistically significant for all models, except in the case of young firms (column 2). Thus we removed this interaction term and re-ran the model in column (3). This suggest that, with exception of those in young firms, males with a high school education or more are actually less likely to engage in any sort of business stages compared to females

⁶ For further information see (Jaccard and Turrisi 2003).

with higher educational attainment. This might explain why men with a high school education are also less likely to close business than women. Similarly, men with secondary school education are less likely to have established business than women (coefficient males).

Advances in narrowing the education gap, and gender differences in unemployment rates and salaries are the likely reasons for increasing female entrepreneurial activity, especially among the more educated. Nonetheless, we also find that men with secondary level education are more likely to become nascent entrepreneurs than women, and that, regardless of education level, men are more likely to start young firms than women.

We find strong evidence supporting hypothesis 2. That is, the composed index of entrepreneurial traits increases the chances of being engaged in entrepreneurial activities, and perhaps as a result makes them also more likely to shut down a business.⁷ The effect of such entrepreneurial traits is stronger among those who have established businesses compared to the effect on nascent and young firms. This could be naturally explained in that established business are more likely to be embedded in larger entrepreneurial-social networks and have a stronger confidence in their knowledge, skills and experience than those in early stages of entrepreneurship.

We also find support for hypothesis 3 in that informal investors, people who provided credit to others to engage in businesses, are more likely to engage in businesses themselves; particularly in the early stages of entrepreneurship; as the literature suggests.

In order to assess the impact of macro factors, we measured the available credit and unemployment rates in logarithm form to normalize the data, transformation that was not necessary for the case of proportion of immigrant population.

Although it is not possible to assess whether the credit available was provided to these firms, or to which sectors, as hypothesis 4 suggests, we found that the availability of credit provided in the market increased the chances of opening businesses for nascent and established firms. It is unclear why this was not the case for young firms, although these firms possibly might have been relying more on informal credit networks.

Turning to hypothesis 5, we found supporting evidence that unemployment affects entrepreneurial activities, but not in a linear way. Specifically, we found a u-relationship between unemployment and the early stages of entrepreneurship. At low levels of unemployment, people were less likely to engage in early stages of entrepreneurial activities (nascent and young firms). However, as the levels of unemployment increase, so do the chances of opening businesses, likely due as the possibility of finding a job is reduced. The opposite happens for established firms. Low levels of unemployment increase the chances of having an established firm, but as unemployment levels increase then there is a negative effect of having an established business, possibly as the

⁷ The variables used to construct this index are the responses to whether the respondent believes: to have the knowledge, skills and experience to open a new business (suskill), to see business opportunities in area (opport) and to have met a successful entrepreneurs over the last year (knowent). The index values ranges from 0 to 3 at individual level.

market size is reduced. Unemployment levels unequivocally affect the chances of shooting down firms, either at low or high levels.

We will move on to assess the impact of the proportion of immigrants in the country. The increase in immigrant population increased the likelihood of opening businesses, and having young and established firms. Also the more immigrants there are, the less likely it is that firms will shoot down businesses. This probably reflects the fact that the immigrant population provides skilled and unskilled labor at a cheaper cost than the native population. Thus we support hypothesis 6.

One of the advantages of using the pseudo-panel is that it also allows us to analyze how entrepreneurial activity varies by cohorts. In support of previous studies, we find an inverted-U relationship between age and the engagement in entrepreneurial activities. Given that knowledge, capital and experience increase with age, over time individuals are more likely to engage in entrepreneurial activities, but only up to a point. In the case of nascent and young firms, entrepreneurship tends to peak at around the late 30s. From the age of 40 onwards, the level of professional and family commitments increases, offsetting the effect of age on entrepreneurial activities (Bergmann and Sternberg 2007). We find the opposite for established firms, specifically for younger relations and those up to their late 20s being less likely to have an established firm than older people.

5.2 Job Creation

We now move on to test the impact of the six hypotheses set on the size of the firms and their expectations of hiring more employees. The results are presented in table (2). Specifically two types of models are presented. One uses as dependent variable the average number of employees hired at each of the stages of the entrepreneurial activity by cohorts. The second type of model refers to the expectation of hiring employees in five years time. In this latter case the dependent variable is on average the expected number of employees to be hired in each of the stages of entrepreneurial activity by cohort. Unlike in the previous sub-section, the models presented here focus exclusively on the people who are already engaged in entrepreneurial activities, in respective stages.

We begin by focusing on hypotheses 1, finding mixed evidence. In the previous sub-section we showed that males with a higher educational level are less likely to open new businesses than females. Nonetheless, we find males here with high school education or more hiring more employees and having the expectations of hiring more male than female employees in the future. Women have higher educational levels in young and established firms than in bigger firms, in terms of employees hired, and they have more expectations of expansion than men with high school education or more.

We find no differences in firm size between males and females with secondary level education in nascent and young firms. Nonetheless, males with secondary level education tend to work for bigger firms and expect to expand more in the future than females with secondary levels (coefficient males).

Table 2 Pseudo-Panel: Job Creation by Stages of Entrepreneurship

| | Nascent entrepreneurs | | Young firms | | Established firms | |
|--|------------------------|--------------------------|-----------------------|--------------------------|-----------------------|--------------------------|
| | Jobs already created | Expected jobs in 5 years | Jobs already created | Expected jobs in 5 years | Jobs already created | Expected jobs in 5 years |
| | IV (1) | IV (2) | IV (3) | IV (4) | IV (5) | IV (6) |
| Male | 1.424 (1.247) | -3.365*** (0.750) | 0.378 (0.429) | 0.275 (0.377) | 3.221*** (0.216) | 3.674*** (0.309) |
| Education high school or more | -6.882*** (1.794) | 6.563*** (1.606) | 5.377*** (0.359) | 4.358*** (0.328) | 2.102*** (0.403) | 7.152*** (0.721) |
| Male*Education high school or more | 3.947*** (1.030) | 3.297** (1.111) | -6.088*** (0.489) | -3.587*** (0.324) | -6.452*** (0.432) | -7.114*** (0.554) |
| GEM individual entrepreneurial index | 1.071** (0.540) | 0.183 (0.359) | -0.551** (0.275) | -0.157 (0.269) | -0.349* (0.183) | 0.144 (0.275) |
| Provided credit to network over last three years | -21.954*** (6.538) | -2.528 (1.572) | 0.868 (1.195) | 1.512 (1.371) | 3.339*** (0.745) | 2.400*** (0.656) |
| Log(Credit) | 12.584*** (2.481) | 6.365** (2.344) | 5.507*** (0.798) | 5.544*** (0.888) | 6.440*** (0.298) | 6.549*** (0.428) |
| Log(Unemployment rate by age and gender) | -16.827*** (4.928) | 5.784*** (0.841) | 1.327*** (0.231) | -0.175 (0.261) | 0.592*** (0.131) | 0.934*** (0.227) |
| Proportion of immigrant poblation | 0.455** (0.183) | -1.951*** (0.590) | -0.779*** (0.152) | -0.712*** (0.161) | -1.095*** (0.053) | -1.364*** (0.079) |
| Cohort (Male aged 16-28 reference group) | | | | | | |
| Male 29-38 | -5.553*** (1.594) | 1.510*** (0.287) | 0.233* (0.140) | -0.121 (0.141) | -0.851*** (0.073) | -1.058*** (0.105) |
| Male 39-48 | -3.459** (1.481) | 3.917*** (0.756) | 0.099 (0.144) | -0.740*** (0.134) | -0.371*** (0.078) | -0.579*** (0.123) |
| Male 49-58 | -6.252** (1.932) | 3.459*** (0.776) | 1.414*** (0.258) | 0.120 (0.220) | 0.046 (0.113) | -0.125 (0.206) |
| Male 58-64 | -6.690*** (1.411) | 1.462 (0.910) | -1.111* (0.569) | -1.795*** (0.346) | 0.208 (0.135) | -0.357** (0.175) |
| Female 16-28 | 10.151** (3.259) | -5.306*** (0.663) | -2.512*** (0.348) | -1.268** (0.393) | -0.967*** (0.189) | -1.702*** (0.272) |
| Female 29-38 | 8.672*** (2.584) | -3.552*** (0.518) | -2.520*** (0.294) | -1.190*** (0.335) | -1.018*** (0.158) | -1.633*** (0.218) |
| Female 39-48 | 8.272** (2.703) | -2.909*** (0.446) | -2.367*** (0.305) | -1.975*** (0.357) | 0.120 (0.146) | 0.258 (0.214) |
| Female 49-58 | 3.698** (1.231) | -0.054 (0.422) | -0.660** (0.279) | -1.195*** (0.316) | 0.273** (0.129) | 0.419* (0.219) |
| Female 58-64 | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) |
| Constant | 153.274*** (32.462) | -52.445** (19.493) | -44.402*** (6.811) | -41.383*** (7.647) | -49.953*** (2.615) | -50.673*** (3.987) |
| R-squared | 0.533 | 0.242 | 0.380 | 0.512 | 0.365 | 0.341 |
| Number of observations | 1057 | 3570 | 4674 | 4674 | 9700 | 9700 |

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

Robust standard errors are corrected by heteroscedasticity in parentheses.

Instrumental variables are used to deal with the endogeneity in the unemployment variable.

The instruments used are unemployment insurance rates, which vary by age, and year dummies.

With regards to the effect of the entrepreneurial index, we find mixed support for hypothesis 2. On the one hand, the higher the entrepreneurial index, the more employees nascent entrepreneurs hire. On the other hand, the entrepreneurial index did not affect the expectation of hiring more employees, perhaps as people's confidence in their skills and their ability to recognize business opportunities were limited by market forces. Also we found that people who had higher entrepreneurial index were actually running firms of a slightly smaller size in terms of the number of employees (coefficient -0.55 for young firms and -0.349 for established). We cannot tell if this is because they are running firms who are more capital intensive or because they find optimal to run at smaller size.

With regard to hypothesis 3 we observe that informal investors that become nascent entrepreneurs open significantly smaller firms. One reason for this might be that these informal investors might only rely on informal credit networks and not on formal ones, thereby finding it difficult to expand their businesses. However, those informal investors who are engaged in established firms do have bigger firms. This could be

explained as the evidence in the literature suggesting that those who survive in later stages of entrepreneurship rely less on informal credit networks having access to credit markets.

Regarding hypothesis 4, we find consistent evidence to support the argument that the availability of credit did increase the size of firms as well as improving the expectation of hiring more employees at all stages, for nascent, young, and established firms.

Turning our attention to hypothesis 5, we find mixed evidence. We do not find evidence of a quadratic relationship between unemployment and levels and job creation as in the previous sub-section, but a linear one. Specifically, the higher the unemployment rates, the smaller the size of the nascent firms. This could be explained as unemployment pushing people into becoming entrepreneurs, as the new firms that opened did so at small size. We carried out further checks to find if the sizes of the new firms had reduced, regardless of whether the new firms was open by need or by choice (findings not presented in table). Unemployment levels did, however, have a positive effect on the number of employees hired by young and established firms. Higher levels of unemployment also improved the expectations of hiring more people in five years time among the nascent and established firms. The reason for this positive effect might be that a labor market with a high level of young unemployed and low salaries provides incentives to firms to hire at low cost.

To conclude, we focus on the effect of immigration, hypothesis 6. The evidence is mixed. On the one hand, the flow of immigrants contributed to new businesses creating more jobs, possibly as these new firms took advantage of the supply of cheap labor. On the other hand, the flow of immigrants did not benefit job expansion nor the expectations to create more jobs in the future. As a matter of fact, the more immigrants arrived, the more the number of employees hired by young and established firms was reduced, albeit just slightly (0.77 workers for TEAs and 1 employee for established firms). There could be several underlying reasons for this. For instance, the obvious factor could be that immigrants displaced the native labor force. However, as mentioned earlier, other studies have found no evidence that the flow of immigrants affected employment rates or the wages of the native population (Carrasco et al. 2008). So a more likely explanation as to why we do not find a positive impact of immigration on job creation is that immigrants were mostly employed in sectors with low productivity that did not require operations on a large scale such as agriculture, domestic services or construction. Also, drawing from the experience of other countries, it could also mean that immigrant entrepreneurs were hiring employees but only among their counterparts and family and not for the rest of the economy (Li 2007; Sanders and Nee 1987).

6. Policy Implications

In this section we discuss the policy implications that can be implemented to aid the creation and maturity of firms and their job expansion. Our results suggest that, although education has offered women an important tool to engage in entrepreneurial activities other welfare policies should also focus on integrating women into the labor force, and making work and family life compatible in order to create broader career choices. Maternity

leave benefits, for instance, are below those of the average EU country. Thus women rely heavily on family structures, so limiting their career choices and regional mobility (Ray et al. 2009). Recent evidence gathered from the OECD shows that while the cultural, economic and political framework can create a positive environment for women's employment in general, 'women-friendly' public policies are essential to achieve a more egalitarian labor market integration of women, with particular reference to maternity and paternal leave schemes as well as childcare arrangements (Stadelmann-Steffen 2008).

Our results also suggest that providing broader access to credit would be beneficial. However, given the current vulnerability of private banking, the support of small businesses cannot rely on this sector alone, and alternative sources of public and private financing, are required. Special programs aimed at financing small companies, including those of immigrants, have gained popularity in Canada and the USA, and to a lesser extent in Europe (OECD 2011). In these programs, not only public resources are used, but those that rely on NGOs and communities themselves (Bates 2001). Other programs can also help by improving financial literacy, and can even assist in creating a set of entrepreneurial plans (Gutiérrez-Romero 2009). Also NGOs, governments, universities and successful entrepreneurs have developed projects in which young and college students are able to explore entrepreneurship as a career choice (Gutiérrez-Romero 2008; Mars et al. 2008).

With regard to immigration, recent evidence from OECD countries shows that immigrants contribute to the economic growth of their host countries in various ways, such as bringing new skills, reducing labor shortages and allowing the integration of women in the labor market (Fundación Ideas 2011; OECD 2010; Saxenian 2002). For instance, Saxenian (2002) finds evidence that immigrant entrepreneurs in Silicon Valley have created both new jobs and clusters of "edge of novelty", accounting for one third of the entire scientific and engineering workforce in the region. Nonetheless, the potential of immigration as a source for creation of businesses and jobs in their host countries has received limited attention, probably because of the perception of immigrants in previous immigration waves as being unskilled and impoverished.

The profile of immigrants has dramatically changed in Spain. Previous studies have highlighted that immigrants in Spain, particular those from outside the EU, find it difficult to integrate into the Spanish labor market, despite the fact that on average they have a higher education level than the native population. For instance, Fernández and Ortega (2008) find that immigrants struggle to integrate into the labor market on their arrival, and face higher initial unemployment rates and using more temporary contracts than natives. Only five years of after the immigrants' arrival their participation rates start converging with these of the natives. Furthermore, the various immigration reforms that Spain has introduced have increased the barriers for immigrants in terms of them fully integrating into the labor market, (Villena Rodríguez 2004).⁸ Thus, many

⁸ For instance, prospective immigrants must demonstrate they have a job waiting for them and obtain the respective working visas and residence permit before arriving to Spain. These permits can take several months to obtain. Another barrier is that Spain does not recognize degrees taken abroad, unless they are co-validated, even those taken within the EU. The co-validation of each degree takes several months, and sometimes up to a year, and can cost up to €1000; a cost that must be

immigrants are forced to open their own businesses, out of need. But since also they lack adequate institutional support and access to credit to exploit business opportunities, their firms are less innovative, and of lower quality than the Spanish counterparts and thus are more likely to fail (Corduras 2008; Gúemes and Corduras 2010), evidence that has also been found in other European countries (Kloosterman 2000).

Several factors contribute to immigrants not receiving adequate sources of credit. For instance, banks might reject credit applications from immigrants due to their lack of credit history in the country, language barriers, a history of denied credit applications in the host country and the known fact that immigrant firms have a higher failure rates than those of natives (OECD 2011). Thus, one important policy could be to enable immigrants to have access to credit, which will thereby increase their chances of survival and move them away from the traditional low-productivity sectors they have been confined to. This could be very important, considering that Spanish productivity has not grown for several years. Evidence from USA banking associations shows that providing credit to migrants can be profitable, as due to the strong links within the immigrant communities, they can rely to their community resources, allowing their credit to perform better than the loans given to locals (Bates 2001). To ensure that immigrants receive the benefit of private and public credit sources, governments can place bilateral agreements on credit register cooperation put in that improve the accuracy of information on their creditworthiness (Atallah and Rebelo 2006).

The article also found evidence that high unemployment rates increase the chances of firms failing. Various countries have used an array of policy interventions to deal directly with unemployment, ranging from facilitating fiscal stimulus to areas that show greater levels of unemployment, or targeting job-training programs at young people, so encouraging the mobility of people across sectors and regions (Werner et al. 2010). These are policies that Spain has not explored, and which place it at the bottom of the EU average in terms of resources used for active labor policies and fiscal stimulus (Werner et al. 2010). Not much has been done to reduce the red tape that people face when trying open a new business or too gain access to credit. According to the 2012 Doing Business data gathered by the World Bank, to open a new business in Spain one must currently follow 10 procedures which take an average of 28 days to complete, which is more than double the procedures and time necessary on average in the OECD. Furthermore, the amount of taxes and mandatory contributions to labor paid by the business as a percentage of commercial profits in Spain (36.7%) is higher than the average OECD (24%).⁹ The Spanish strategy has been to focus instead on de-regulating the labor market, making it easier and cheaper to hire and fire employees, but these reforms that have been found to have limited effectiveness in creating new

borne by the immigrant and not by the prospective employers. This example of red tape, along others which are characteristic of the Spanish bureaucracy, are conducive to the growth of the informal economy, where immigrants, despite having a similar background to members of the native population, are forced to earn lower salaries and engage in low productivity sectors.

⁹ Information taken from <http://doingbusiness.org/data/exploreconomies/spain#paying-taxes>

jobs (Estrada et al. 2011; Werner et al. 2010). Financial efforts have been targeted on rescuing banking and cutting government spending. These are policies that Spain will have to reconsider if it wants to accelerate the reduction of its currently historically high unemployment and lack of productivity.

7. Conclusion

The purpose of this article has been to bridge the gap in the literature in investigating the individual factors and market forces that affects Spanish firm's life cycle as well as its role in job creation. For this purpose we constructed a pseudo-panel using the Spanish Global Monitor Entrepreneurship (GEM) survey following cohorts of generations over the period 2001-2008. We found several factors that affect the chances of entrepreneurial success and that go beyond the factors that entrepreneurs can control. Our results offer important insights into how sustainable entrepreneurship could be encouraged as well as foster the creation of jobs.

Firstly, we found rare evidence that women with higher levels of education are more likely to engage in entrepreneurial activities than men. The reasons as why this is the case are likely to be related to the segregation found in the labor market. Other studies supporting this argument have found that unemployment rates for women have been higher than those of men for every single age and education bracket. This is out of need, as there are not many other opportunities available for women to turn to business.

Secondly, while we do not have information on exactly how much of the credit available in the economy has been dedicated to business activities, our results suggest that the credit available that Spain enjoyed during much of the period in question contributed towards its entrepreneurial sector and expansion. There is evidence that the start up of businesses was much reduced in 2008 and especially in the two subsequent years. This coincided with the sharp credit contraction that the economy suffered. No matter how flexible the rules for hiring or firing people, firms will have no capacity to respond if they have no adequate funding.

Thirdly, although just before the 2008 crisis, Spain had its lowest unemployment rates in several years, these were still higher than the average in the EU, and were especially high among youth and women. We found evidence that these high unemployment rates pushed people into self-employment and towards starting very small business. Other studies found a negative correlation between unemployment and business creation (Congregado et al. 2010). Nonetheless, we also found that unemployment rates contributed to increasing the risk of business failure. Overall, the expectations of businesses expanding were not, however, affected by the unemployment rates over the period analyzed. This is likely as unemployment rates in 2008, when the economic crisis began, were not particularly high in comparison to the unemployment rates of the 1990s and not close to the unemployment rates they are now (Carballo 2011). In the two subsequent years, unemployment rates trebled, hence their impact on expectations about business expansion are likely to have dramatically changed, for the worse.

Fourth, the article also analyzed the overall impact of the sustained immigration flows that Spain received on entrepreneurial activities. We found that these immigrations flows contributed to the creation and

maturity of business and reduced the risk of failure for businesses in the economy. Nonetheless we found no evidence that the flow of immigrants contributed towards creating more jobs.

The overall evidence suggests that improving access to credit markets and targeting policies for reducing youth unemployment, as well as facilitating the integration of immigrants, could be one of the most efficient ways of promoting entrepreneurship, ensuring firms' survival and creating more jobs. Banks themselves can encourage the set up of small firms, including the ones of immigrant enterprises (Berger et al. 2004). There are indeed examples which offer tailored seed loans as well as expansion loans (OECD 2011). The current financial crisis, however, has much reduced the availability of credit and Spain has recently been forced to provide a bank bailout due to the plunge in the value of the housing sector (BBC 2012). As a result, Spain has also begun restructuring its banking sector. These restructuring plans should take into account how credit could be provided to kick-start the entrepreneurial sector and job-creation. However, as Shane (2009) argues, in order to foster development and the job creation policies, makers should prioritize the support of those innovative firms which are more likely to survive and which have growth potential.

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Appendix

Table A.1 Job Creation by Stage of Entrepreneurship

| Average size 2001-2008 | Jobs created | | | Expected jobs in 5 years | | |
|------------------------|---------------|----------------|---------------|--------------------------|----------------|---------------|
| | 0-5 Employees | 6-19 Employees | 20+ Employees | 0-5 Employees | 6-19 Employees | 20+ Employees |
| Nascent Entrepreneurs | 89.09 | 9.01 | 1.9 | 83.73 | 12.74 | 3.53 |
| Young Firms | 86.73 | 10.44 | 2.83 | 78.78 | 15.68 | 5.54 |
| Established Firms | 85.59 | 10.44 | 3.97 | 81.81 | 12.59 | 5.59 |

Source: GEM survey 2001-2008.

Table A.2 Gender Differences by Stages of Entrepreneurship

| | Nascent Entrepreneurs | | | | Young Firms | | | | Established Firms | | | | Firms Closed | | | |
|------|-----------------------|--------|--------------|--------|-------------|--------|--------------|--------|-------------------|--------|--------------|--------|--------------|--------|--------------|--------|
| | Secondary - | | Highschool + | | Secondary - | | Highschool + | | Secondary - | | Highschool + | | Secondary - | | Highschool + | |
| | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female |
| 2002 | 70.7 | 29.3 | 90.3 | 9.7 | 69.0 | 31.0 | 61.0 | 39.0 | 58.8 | 41.2 | 71.9 | 28.1 | 62.3 | 37.7 | 54.2 | 45.8 |
| 2003 | 72.2 | 27.8 | 64.9 | 35.1 | 74.7 | 25.3 | 54.8 | 45.2 | 58.7 | 41.4 | 69.4 | 30.6 | 61.8 | 38.2 | 4.1 | 95.9 |
| 2004 | 70.7 | 29.3 | 83.6 | 16.4 | 67.8 | 32.2 | 77.6 | 22.4 | 69.6 | 30.4 | 60.3 | 39.8 | 50.1 | 49.9 | 65.2 | 34.9 |
| 2005 | 59.1 | 41.0 | 60.2 | 39.8 | 66.8 | 33.2 | 61.5 | 38.5 | 56.3 | 43.7 | 56.7 | 43.3 | 69.8 | 30.2 | 73.0 | 27.0 |
| 2006 | 64.0 | 36.1 | 62.5 | 37.5 | 58.0 | 42.0 | 61.7 | 38.3 | 70.0 | 30.1 | 69.5 | 30.5 | 58.7 | 41.3 | 67.5 | 32.5 |
| 2007 | 68.1 | 32.0 | 60.8 | 39.2 | 61.5 | 38.5 | 66.8 | 33.2 | 64.6 | 35.4 | 63.8 | 36.2 | 47.7 | 52.3 | 52.2 | 47.8 |
| 2008 | 68.1 | 32.0 | 55.5 | 44.5 | 59.7 | 40.3 | 59.1 | 40.9 | 60.4 | 39.6 | 57.8 | 42.2 | 48.5 | 51.5 | 52.6 | 47.4 |

Source: GEM survey 2001-2008.

Table A.3 Number of Observations per Cohort

| Cohort | Freq. | Percent |
|----------------|----------------|---------|
| Male 16-28 | 19,400 | 14.99 |
| Male 29-38 | 16,290 | 12.58 |
| Male 39-48 | 14,902 | 11.51 |
| Male 49-58 | 11,413 | 8.82 |
| Male 58-plus | 1,994 | 1.54 |
| Female 16-28 | 17,361 | 13.41 |
| Female 29-38 | 17,372 | 13.42 |
| Female 39-48 | 16,243 | 12.55 |
| Female 49-58 | 12,303 | 9.5 |
| Female 58-plus | 2,167 | 1.67 |
| Total | 129,445 | |

Source: GEM survey 2001-2008.

Table A.4 Summary of Main Variables

| Variable | 2001 | | 2002 | | 2003 | | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | |
|-------------------------------------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|
| | Mean | Std. Dev. |
| Nascent entrepreneurs by cohorts | 2.78 | 2.07 | 1.75 | 1.76 | 4.40 | 2.64 | 1.96 | 1.29 | 2.26 | 0.69 | 2.72 | 1.06 | 3.42 | 1.19 | 3.09 | 0.52 |
| Young firms by cohort | 2.78 | 1.57 | 2.38 | 1.66 | 2.42 | 1.91 | 3.28 | 1.83 | 3.64 | 1.04 | 4.06 | 1.35 | 4.14 | 1.37 | 3.79 | 1.23 |
| Established firms by cohort | 4.22 | 3.85 | 7.75 | 4.08 | 5.00 | 1.93 | 8.01 | 4.65 | 8.50 | 1.87 | 5.66 | 2.86 | 6.80 | 2.52 | 9.51 | 2.67 |
| Firms closed by cohort | - | - | 4.88 | 1.52 | 1.80 | 1.06 | 1.40 | 0.40 | 1.32 | 0.40 | 1.23 | 0.32 | 0.91 | 0.19 | 1.34 | 0.14 |
| Education high school* by cohort | - | - | 22.70 | 9.93 | 21.05 | 7.46 | 24.11 | 6.88 | 28.82 | 4.87 | 26.31 | 8.67 | 41.24 | 10.90 | 45.67 | 11.27 |
| Male | 46.92 | 49.92 | 47.55 | 49.95 | 50.40 | 50.01 | 51.14 | 49.99 | 46.97 | 49.91 | 49.25 | 50.00 | 49.82 | 50.00 | 50.12 | 50.00 |
| GEM Entrepreneurial Index by cohort | 1.35 | 0.36 | 1.28 | 0.23 | 1.06 | 0.14 | 1.14 | 0.19 | 1.30 | 0.13 | 1.21 | 0.21 | 1.23 | 0.20 | 1.20 | 0.12 |
| Unemployment rate by cohort | 11.29 | 6.68 | 11.85 | 6.21 | 11.88 | 6.35 | 11.53 | 6.12 | 8.91 | 4.77 | 8.91 | 5.24 | 8.60 | 4.97 | 11.54 | 6.18 |
| | 2.78 | 1.57 | 2.38 | 1.66 | 2.42 | 1.91 | 3.28 | 1.83 | 3.64 | 1.04 | 4.06 | 1.35 | 4.14 | 1.37 | 3.79 | 1.23 |

Source: GEM survey 2001-2008.

Table A.5 Correlation of Main Variables at Cohort Level

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) |
|--|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|---------|------|
| (1) Nascent entrepreneurs | 1 | | | | | | | | | | | | | | | | |
| (2) Young firms | 0.7957* | 1 | | | | | | | | | | | | | | | |
| (3) Established firms | 0.2566* | 0.1511* | 1 | | | | | | | | | | | | | | |
| (4) Firms closed | 0.0170* | 0.0311* | 0.2086* | 1 | | | | | | | | | | | | | |
| (5) Jobs created by nascent | -0.2456* | -0.2601* | 0.1797* | 0.4978* | 1 | | | | | | | | | | | | |
| (6) Expected jobs in 5 years by nascent | 0.0068 | 0.0123 | 0.1854* | 0.5816* | 0.6638* | 1 | | | | | | | | | | | |
| (7) Jobs created by young firms | 0.1225* | -0.0501* | -0.1077* | -0.0987* | 0.3477 | 0.021 | 1 | | | | | | | | | | |
| (8) Expected jobs in 5 years by young firms | 0.1318* | 0.0256 | -0.2313* | -0.2496* | -0.193 | -0.065 | 0.6893* | 1 | | | | | | | | | |
| (9) Jobs created by established firms | 0.0456* | -0.0226* | -0.0794* | 0.2006* | 0.0637 | 0.0720* | 0.0338 | -0.1170* | 1 | | | | | | | | |
| (10) Expected jobs in 5 years by established firms | 0.1465* | 0.1099* | -0.0944* | 0.3412* | 0.3015* | 0.1814* | 0.0051 | -0.1534* | 0.9251* | 1 | | | | | | | |
| (11) Education high school or more | 0.5879* | 0.5471* | 0.0371* | -0.1280* | -0.089 | -0.019 | 0.2743* | 0.2085* | -0.1395* | 0.0397* | 1 | | | | | | |
| (12) Male | 0.5760* | 0.5536* | 0.5308* | 0.2388* | 0.044 | 0.0853* | -0.1385* | -0.1655* | 0.2238* | 0.2723* | 0.1258* | 1 | | | | | |
| (13) GEM Entrepreneurial Index | 0.7233* | 0.7638* | 0.2641* | 0.1898* | -0.095 | 0.0694* | -0.1233* | -0.1291* | 0.0884* | 0.2196* | 0.5056* | 0.6439* | 1 | | | | |
| (14) Provided credit | 0.6521* | 0.6187* | 0.4452* | 0.2433* | 0.02 | 0.1727* | -0.024 | -0.0971* | 0.2258* | 0.2674* | 0.2443* | 0.7185* | 0.5715* | 1 | | | |
| (15) Unemployment rate | -0.2577* | -0.1605* | -0.5313* | -0.0445* | 0.1163* | 0.021 | 0.1296* | 0.0804* | -0.0866* | -0.0182* | 0.3302* | -0.6582* | -0.2065* | -0.4908* | 1 | | |
| (16) Immigrants | 0.2731* | 0.2081* | 0.1770* | -0.3775* | -0.5265* | -0.1764* | 0.3933* | 0.4041* | -0.1956* | -0.2037* | 0.6046* | 0.006 | -0.008 | 0.1171* | 0.0024 | 1 | |
| (17) Log credit | 0.3161* | 0.2207* | 0.1169* | -0.3833* | -0.5221* | -0.1771* | 0.4061* | 0.4423* | -0.1436* | -0.1516* | 0.6059* | 0.0067 | -0.001 | 0.1414* | -0.0308* | 0.9785* | 1 |

Significance Level * p<0.10

Source: GEM survey 2001-2008.

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