



Paper to be presented at the  
35th DRUID Celebration Conference 2013, Barcelona, Spain, June 17-19

## **Differences between innovative and non-innovative microenterprises:**

### **internal factors**

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### **Abstract**

This exploratory study presents a comparison between two samples of microenterprises. One sample is formed by companies involved in product innovation during the current economic crisis and the other is formed by companies not involved in product innovation during the same period. The comparison analyzes which internal factors, supported by the literature as the influential factors of small business innovation, are significant when explaining the main differences between innovative microenterprise and non-innovative ones. The results suggest that the factors related to the organization and activity of the company are the factors which explain the differences between these two types of firms, rather than those factors related to micro-entrepreneur's own profile.

## **Differences between innovative and non-innovative microenterprises: internal factors**

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This exploratory study presents a comparison between two samples of microenterprises. One sample is formed by companies involved in product innovation during the current economic crisis and the other is formed by companies not involved in product innovation during the same period. The comparison analyzes which internal factors, supported by the literature as the influential factors of small business innovation, are significant when explaining the main differences between innovative microenterprise and non-innovative ones. The results suggest that the factors related to the organization and activity of the company are the factors which explain the differences between these two types of firms, rather than those factors related to micro-entrepreneur's own profile.

**Keywords:** microenterprise, innovation, comparative analysis, entrepreneur, age, education, gender, organizational factors.

**JEL:** L26, O31, M21.

### **1. INTRODUCTION**

Nowadays, globalization is a reality in the current business paradigm. This new global business model is based on the high degree of interaction between agents, accessibility and speed of information, the development of new channels and forms of communication, the improvements in logistics and transportation, and international competitiveness. This framework, together with the evolution and adaptation of technologies to this new social and cultural context, suggests that the development of innovation will be one of the most influential factors in the business environment in the coming decades.

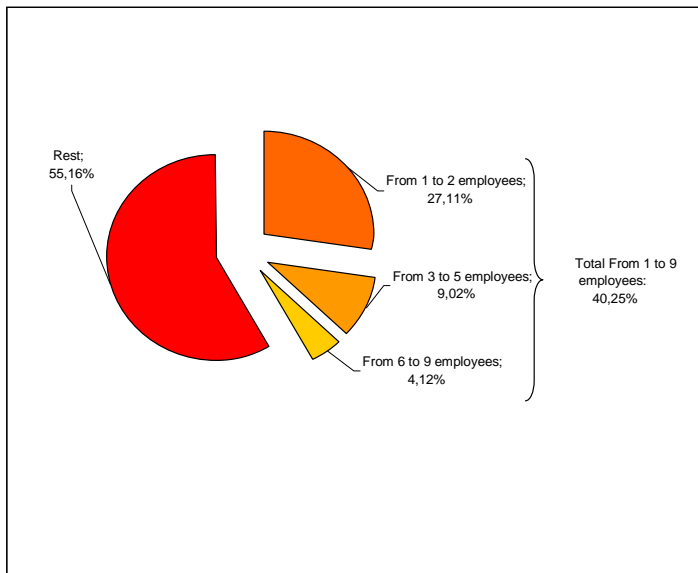
In recent years, innovation has been a key ingredient in shaping the strategies of companies, regardless of their size or legal form. In order to optimize the innovation capacity of a company, innovation should be considered and included as the most important component in the DNA and strategy of the enterprise. Apart from innovation, enterprises need to have sufficient resources to

be able to develop and launch new products, be flexible enough in their structure and processes to solve everyday problems creatively, and have an ability to connect innovativeness with their general and specific objectives (Bhaskaran, 2006).

Taking the above into consideration, the enterprise's size is not a determining factor in the need to keep innovating to achieve the enterprise's long-term survival. However, size does seem to be a factor that determines the allocation of the resources that enterprises need to innovate. Therefore size affects the design and implementation process of efficient strategies. In fact, several studies have analyzed the differences between large and small firms in relation to the potential benefits that both types of enterprises present in the development of innovations (Hadjimanolis, 2000). According to these studies, large companies seem to have certain advantages with regard to the development of innovations in capital-intensive industries, where economies of scale can occur. Additionally, these works conclude that small firms seem to be more successful in the development of innovation in industries where skilled labor represents an important factor (Acs and Audretsch, 1990). However, no studies which analyze the differences between innovative companies have been found in the literature review, hence the rationale for this work.

On the other hand, large and small businesses do present differences in the allocation of resources for developing innovation activities (Rizzoni, 1991). It is generally accepted that small firms tend to have more limited resources, less influence on the market, and less formal communication mechanisms than large enterprises (Dickson et al., 1997). However, some studies show how the strengths of small businesses in innovation do not rely as much on the availability of resources (at least tangible ones), but on certain behavioral characteristics, more linked to the figure of the managers (Vossen, 1998; Kotey and Meredith, 1997; Peteraf and Shanley, 1997, p.167). As a result, there are certain differences in the adoption of innovation strategies between small and large firms (Yap and Souder, 1994). This article belongs to a new line of research studying innovation in microenterprises, continuing along the lines of earlier works on this subject such as the study of factors that determine the innovative capacity of microenterprises (Benito-Hernandez, et al., 2012). This area is even more important in the case of Spain, where this type of enterprise has a large presence in the business landscape (Figure 1).

Figure 1. Enterprises' structure according to the number of employees. Spain, 2012)



Fuente: Statistics National Institute (INE, 2012)

For all of the above arguments, it would be interesting to have a clear understanding of the principal characteristics which define the profile of innovative enterprises. Therefore, this paper aims to contribute to the study of microenterprises, specifically in the field of innovative capacity in microenterprises. This work tries to find and explain those internal factors studied by the previous literature which seem to explain the differences between enterprises which are innovative and those which are not.

The paper is organized as follows: section 2 contains a brief review of the theoretical background of innovation, and explains the vision and consideration of this concept in this paper. Section 3 includes a review of the theoretical and empirical background related to the factors studied in the present work. Section 4 contains an empirical study and presents the methodology and results obtained. The last section presents the conclusions drawn from the work carried out.

## **2. RANGE AND FIELD OF ACTION OF INNOVATION**

The innovative nature of enterprises has been widely studied in the scientific literature. Innovation has traditionally been associated with large multinational companies (Vossen, 1998) although in recent times there is increasing interest in analyzing the role of small businesses in

the innovation processes. Large enterprises have an advantage in product innovation as they have economies of scale from belonging to highly capital-intensive industries, which cannot be expected in small businesses. However, small businesses are often more successful in industries where the weight of skills and abilities has a special significance (Acs and Audretsch, 1990). The strengths of small businesses do not reside in resources but in characteristics such as flexibility and motivation (Vossen, 1998).

The innovative nature of the small business is a determinant factor in its competitiveness. Many of the barriers to innovation that limit the competitiveness of small businesses arise as a result of a lack of financial resources; inefficient management; a lack of skilled workers, weak external information and a lack of protection against government regulations (Buijs, 1987; Rothwell, 1994; Freel, 2000).

According to Gee, S. (1981), innovation is «the process in which, from an idea, invention or recognition of need a product, technology or useful service is developed and commercially accepted». Similarly, Pavón, and Goodman (1981) define innovation as «the set of activities within a certain period of time and place that take an idea to its first successful introduction into the market, in the form of new or improved products, new or improved services, or new organizational and managerial measures».

The term "innovation" is complex and multidimensional (Avlonitis et al., 1994). While there are various types of innovation, such as process innovation, marketing, organizational or product innovation, (Organization of Economic Cooperation and Development, 2005), it is also true that several authors have proposed that the development of new products is a result of the innovation process carried out by small enterprises (Damanpour, 1996) and microenterprises (Benito Hernandez et al., 2012). In this sense, and in order to make it easier to understand the survey carried out on the micro entrepreneurs, this paper considers product innovation as a key factor, which is able to indicate the innovative capacity of the microenterprises in this study.

### **3. THEORETICAL AND EMPIRICAL BACKGROUND**

Certain factors contribute in varying degrees to the determination of the innovation capacity of small businesses. Benito Hernandez et al., (2012), state that certain environmental factors, whose influence has been widely proven in the case of large enterprises, are less powerful as an explanation of the decision to innovate in smaller companies, in favor of internal factors, associated with the individual figure of the micro entrepreneur and other cultural, financial and organizational aspects. Some potentially important factors are the initial level of education, experience, training of workers, or the use of technology (Romijn and Albaladejo, 2004).

Internal factors have been analysed by various studies, which have attempted to demonstrate the similarity between the role of the entrepreneur and the company's strategic objectives. In this sense, several authors have studied the convergence of the personality of small businesses with the corporate goals of the small enterprise, concluding that the behavior of small businesses is usually similar to the manager's behavior (Kotey and Meredith, 1997; Peteraf and Shanley, 1997, p.167). One data that adds robustness to these conclusions can be found in the statistics on Spanish businesses provided by INE in 2011, which show that more than fifty percent of them had no more employees than the owner. Thus, the first condition for the above conclusion seems to be true. Therefore the importance of the relationship between the characteristics of micro entrepreneurs in the performance of their functions and the innovative process of micro enterprises is highlighted.

In this section a literature review of internal factors is conducted. This is structured in two different blocks. The first block focuses on analyzing the precedents found in the scientific literature which have attempted to study those intrinsic personal or intellectual characteristics of the entrepreneur that seem to have an influence on the innovation capacity of the enterprise. The second section presents a literature review that focuses specifically on those internal factors related to the organization and activity of the enterprise that seem to affect the enterprise's innovative strength.

### **3. 1. FACTORS ASSOCIATED WITH THE EMPLOYER PROFILE**

As seen in some proposals for future research, some authors consider that it useful to analyze how different managerial factors such as age, education and background of the micro entrepreneur affect business orientation (Souitaris, 2001, Mai Thi Thanh Thai, 2010) with regard to the innovative nature of micro entrepreneurs and consequently that of microenterprises. In this sense, Altinay and Wang (2011) exposed how educational attainment equips business owners with the skills and reflective mindsets of understanding customers and responding to their needs. Previous business experience of the entrepreneur also impacts positively upon a firm's entrepreneurial orientation.

Therefore, in the following passages this paper presents a review of the literature related to different personal features of the micro entrepreneur that seem to determine micro enterprise innovation intensity and strategic decisions of the same. These features are the micro entrepreneur's age, the micro entrepreneur's educational level, the micro entrepreneur's expertise or the gender of the micro entrepreneur.

The role of the founders and entrepreneurs has been analyzed by various scientific studies, which have studied the relationships between different personal and intellectual characteristics of the entrepreneur, and the growth and performance of the enterprise (Cooper et al., 1994; Vivarelli, 2004, Bosma et al., 2004; Colombo and Grilli, 2005). In addition, this research has produced studies controlling for different variables, such as the age of the founder or their level of education, on the future development of their companies. Other works have focused on studying how the growth of small enterprises is strongly linked to the will of its founders to grow (Delmar and Wiklund, 2008). In this line, Stam and Wennber (2009) studied the specific effects of the intrinsic characteristics of the founder on the company's performance as control variables in a small sample of Dutch companies.

The age and the maturity of the entrepreneur has traditionally been one of the variables included in studies on competitiveness, entrepreneurship and innovative capacity of enterprises. A priori, the age of the entrepreneur presents a nonlinear negative relationship with entrepreneurship and

innovation: as age increases, the propensity to innovate seems to increase. However this propensity begins to decrease over the years, due mainly to the loss of technological skills and lack of adaptation to change (Verheul et al., 2001, Aubert et al., 2006).

However, one can assume a positive relationship between the age of the enterprise and its innovation performance based on the accumulated experience that the enterprise acquires throughout its life (Wignaraja, 2002; Diaz Diaz et al., 2006, Jiménez Jiménez et al., 2006; Álvarez Llorente and Giráldez Otero, 2007). As mentioned in the previous section, the behavior of small enterprises usually converges with the personality of their manager (Kotey and Meredith, 1997; Peteraf and Shanley, 1997). This convergence can also be observed between the age of the micro enterprise and the age of the micro entrepreneur, in terms of innovation development over time. In this regard, older companies or entrepreneurs are more likely to develop an innovative capacity than younger enterprises or managers (Huergo and Jaumandreu, 2004). Along these lines, several studies have addressed the relationship between the age of the micro entrepreneur, the age of the micro enterprise, and its technological and innovative capacity. (Ford et al. Palvia and Palvia 1996 and 1999).

Other studies have explained the relationship between the innovative business capacity and the maturity of the enterprise within the industry (DiMaggio and Powell, 1983; Aldrich and Fiol, 1994). The authors explain how a company or entrepreneur born in an emerging industry often finds problems of institutional support, uncertainty about the availability of resources, or some socio-political risks. By contrast, innovative enterprises or innovative entrepreneurs born in a traditional industry are likely to encounter other problems, such as increased competitive intensity, or the need to differentiate within a homogeneous competitive framework. For this reason, the age of the company is usually an indicator of the need to innovate. Therefore, if an entrepreneur or an enterprise operates for a long time in a mature industrial sector it will have a higher propensity to innovate. In contrast, companies or entrepreneurs with few years of experience in emerging industries will have priorities other than innovation, in order to consolidate their position in the sector.



The relationship between the entrepreneur's level of studies and the innovativeness of the enterprise has also been studied by a large amount of research. In this sense, Hausman (2005) finds a positive relationship between innovation of enterprises and the educational level of their entrepreneurs, concluding that managers with a more limited education turn out to be less innovative managers. The educational background of those running the company is a positive factor in the adoption of innovation, which allows for greater innovativeness (Levenburg et al., 2006).

In line with the general guidelines of the literature studied it can be deduced that the education level of the small businessman has a strong influence on the innovative activities of the firm (Peterman and Kennedy, 2003; Baron, 2004) especially in the development and implementation of innovative projects (Zahra and Pearce 1994).

However, no studies have been found in the literature which specifically explain and discuss the relationship that may exist between the micro entrepreneur's gender and the decision to innovate or the innovativeness intensity of small enterprises. Some work has been done regarding the development of new company strategies in times of crisis and no gender differences have been identified in the results (Benito Hernandez, 2010). Additionally, in other studies researching the fact that female entrepreneurship rates are practically half that of men (Marlow, 2002; Greer and Greene, 2003), the explanation is due to the low presence of women in the circles of economic and financial power. Other research has also studied how the lack of power and professional networks in the case of women results in them having less access to credit and financial resources, with credit institutions often demanding higher interest (Coleman, 2000) and greater guarantees (Fraser, 2005). There are other factors to consider such as the contribution of human capital to the company, based on experience and professional skills development, which in general is more developed in men, as they have more experience and have acquired higher hierarchical levels in different organizations (Marlow, 2002; Collins-Dodd et al., 2004).

Given the above, it is particularly interesting to analyze the influence of internal factors in the innovative activity of microenterprises through the enunciation of the following hypothesis:

H1 = Innovative micro enterprises differ from non-innovate micro enterprises in aspects related to the profile of the entrepreneur.

### **3. 2. ORGANIZATIONAL FACTORS OF THE MICRO ENTERPRISE**

Other internal factors to be considered in the proposed analysis are those related to the organization and activity of the micro enterprise, such as the use of information technology for management, the corporate values and the consideration of business culture, the use of cooperative alliances as organizational strategies, or the scope of the company.

The use of technology by enterprises is a determining factor in the intensity of innovation. Good management of information can mean the difference between success and failure for the projects undertaken. In this way the company can achieve a competitive edge in the market and increase development capacity (García-Gutiérrez Fernández et al., 2004). Several authors have highlighted the general importance information technology, and in particular the internet, can play in improving the competitiveness of micro enterprises, reducing costs and the risk associated with transactions (Bakos, 1991, pp. . 295-310; Strader and Shaw, 1997, p. 185-198), optimizing the value chain and facilitating the dissemination of knowledge (Porter and Millar, 1985, p. 149-160).

Much literature has been produced about how the increasing use of information and communication technology (ICT) has increased the efficiency of companies and their ability to innovate and improve performance and competitive advantage (Dewett and Jones, 2001; Madsen and Ulhoi, 2005; Dibrell et al., 2008; Kyvik and The Tarabishy, 2009). Several studies have attempted to relate the results of innovation and growth to the use of ICT, showing a positive effect between profitability, growth and complementarity between ICT and the innovative nature of the company (Dibrell et al., 2008).

In summary, from the reviewed literature we have concluded that the effective implementation of technology allows companies to receive and process information more efficiently (Perrow, 1967; Hanson, 1999) and thus achieve greater adaptability to the environment (Das et al., 1991).

Consequently, companies often invest significant resources in ICT assets (Krishnan and Sriram, 2000), yet despite the importance of the subject in the scientific literature, the possible relationships between innovation, ICT and performance have not been the subject of extensive research (Dewett and Jones, 2001; Aral and Weill 2007). In the context of small and medium enterprises a spillover of ICT from the large enterprises to smaller ones can be observed, helping small enterprises to take more advantageous positions in terms of organizational flexibility and efficiency (Xiang and Lan, 2001; Larsen and Lomi, 2002; Izushi, 2003 , Watanbe Tanabe, 2005). There is therefore the need for small enterprises to be particularly careful with ICT and hire employees who can use ICT in order to implement enterprise-level competition and achieve strategic objectives through innovation (Dibrell et al., 2008).

In the same line, values and corporate culture are also factors to consider in relation to the ability of an organization to manage innovation, and have even come to be regarded as the "main determinants of innovation" (Ahmed, 1998). Although cultural differences and organizational culture have been debated extensively in the literature (Hofstede, 2001, Smith et al., 2008), it is remarkable how values and social responsibility have become essential aspects to study this concept in academic research (Carroll, 1999; Schwartz and Bilsky, 1990). The adoption of social responsibility criteria enables companies to resolve conflicts and distribute the value created by different interest groups (Nieto Fernández Gago and Antolin, 2004). CSR has been widely studied as a strategic resource and source of competitive advantage in the case of large companies, but CSR has also been studied for SMEs, concluding that the same positive causal link exists between the reputation and performance of the enterprise (Santelo López López and Churches, 2010).

Corporate social responsibility (CSR) has become one of the main pillars of business today, to the point of being referred to as the latest trend in management (Antolin Nieto and Fernández Gago, 2004; Guthey et al., 2006). However, consideration of CSR in business has been treated very unevenly. In this sense, Hockerts (2008) found that most companies think of CSR as a tool to reduce operational risks and costs. The great challenge of CSR is to capture it as a driver of innovation.

Another factor widely studied by the literature in relation to business innovation has been the role of networks and geographic proximity in facilitating improvements in technology and business competitiveness (Sternberg, 2000; Romijn and Albaladejo, 2002). The degree of intensity and confidence of business cooperation seems to maintain a positive relationship with the innovative capacity of firms (Love and Roper, 1999).

The benefits of cooperative business strategies appear to be different depending on the size of the company involved in the collaboration. Thus, small businesses seem to benefit more from external research than large firms (Feldman, 1994; Albaladejo and Romijn, 2000). Similarly, small businesses seem to be the most favored in cooperation and links with regional knowledge networks, as well as benefiting from scientific institutions around them (Almeida and Kogut, 1997; Albaladejo and Romijn, 2000). By contrast, there are other positions that contradict this claim and conclude that the benefits from certain alliances are not a determining factor for small businesses (Karlsson and Olsson, 1998). Either way, it does seem to be accepted by most authors that such concentration strategies could be considered as organizational innovation in the field of small business (Benito Hernandez, 2009).

Innovative activity is associated with access to information and contacts that the company has (Freel and Robson, 2004). In this line, ICT plays an important role in the cooperation between microenterprises, for example, Barnes et al., (2012) provides evidence of the attraction and potential of Web 2.0 for collaborations between small businesses. Business alliances are strategies to consider for achieving better results through R&D and, consequently, increased competitiveness in the markets in which the company operates (MacPherson, 1997). Therefore it is reasonable that many authors recommend small businesses conduct concentration strategies through cooperation networks, for example, so they can be more stable, and better able to compete in the market (Garcia-Gutierrez-Fernandez et al. 2006).

For all the above, it is particularly interesting to analyze the influence of internal factors in the innovative activity of microenterprises through the enunciation of the following hypothesis:

H<sub>2</sub> = Innovate microenterprises differ from those that are not in areas related to the use of ICT, organization and culture of the company.

## **4. METHODOLOGY**

### **4.1 COLLECTING DATA**

The field study is a statistical analysis of the study population by choosing a sample. A survey has been used to obtain the data. The population to be analyzed is the 3,128,181 micro enterprises that made up the Spanish business network at December 31, 2009<sup>1</sup>.

From the review of the literature on the characteristics and management of microenterprises in times of crisis, we have developed a questionnaire consisting of twenty closed questions. Initially, we collected some data on the characteristics of microenterprise such as microenterprise capital at the moment it was set up, micro-entrepreneur age, gender, education, future prospects of the microenterprise, whether or not it belonged to networks or new product development, implemented strategies, actions of social responsibility undertaken and other questions related to the central theme of the article.

The surveys have been conducted on micro-entrepreneurs or relatives working in the company both in person and by telephone, and mobile phone numbers and other information, such as how long the company has been operating, have been obtained using the database "Analysis System Iberian Balance" (SABI). Table 1 shows the technical data sheet of the study.

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<sup>1</sup> Datos del directorio de empresas del Instituto Nacional de Estadística a 31 de diciembre del 2009.

Table 1. Technical details of the field study

<b>Population</b>	
Sampling units	Micro
Total population	3128.181
Type of population	Infinite
Elements of sampling	Micro entrepreneurs surveyed
Scope	National
Time	December 2009 - June 2010
<b>Muestreo</b>	
Choice of companies	Random
Type of survey	Face to face and telephone
Number of calls issued	927
Surveys received	148
Response Rate	37%
<b>Subsample 1</b>	
Definition	Innovation microenterprises
Sample size	27
<b>Subsample 2</b>	
Definición	Non innovatio
Sample size	microenterprises 121

Source: author-compiled data.

Finally, the sample was divided into two independent subsamples, the former corresponding to innovative companies and the latter non-innovative ones. This selection was made based on one of the survey questions, which referred to product innovation by the firms surveyed. Innovative companies are considered to be those that developed new products and non innovative those which did not. This may seem like a limitation, but as shown in the literature review, Damapour (1996) put forward the development of new products as a direct result of the innovation process carried out by the small business. Therefore, this paper will consider product innovation as a factor indicative of the innovative capacity of the micro enterprises included in the study.

The choice of which microenterprises to include in the survey was randomly made using a simple random probabilistic choice. Each element of the population has a probability of selection which is known and equitable (Malhotra, 2004).

## 4.2. VARIABLES AND THEIR MEASUREMENT

The dependent variable in this study is innovation. For the reasons stated in the review of literature, it has been considered appropriate to limit innovation in this work to product development.

The other variables in the study that seek to compare the two groups of microenterprises (innovative versus non-innovative) were classified as those directly related to the profile of micro-entrepreneurs and those related to the activity of the company. Both are presented and defined in table 2.

Table 2. Measurement of variables

Type of Variable	Aspect to study	Factor to assess	Definition	Source	Name	Values	Statistical technique to assess
Dependent	Innovation	Product Innovation	New Product Development	Survey	INN	0 = not developed new products 1 = Yes has developed new products	-
Independent entrepreneur related	Profile of micro entrepreneur	Age	micro entrepreneur age		SABI	AGE	Discrete (years)
		Years	number of years of the company's market	EXP		Discrete (years)	“t” or ANNOVA and “U” of Mann-Whitney Test
	Entrepreneur's gender	Entrepreneur's gender	Entrepreneur's gender	Survey	GEN	0=man 1=woman	Chi Square Test
	Regulated education or training	Regulated education or training	Regulated education or training		EST	0 = No qualifications. 1 = Basic studies / primary.	“U” of Mann-Whitney Test

						2 = Secondary school. 3 = High School. 4 = Vocational. 5 = Higher education: undergraduate, engineering, diploma, degree. 6 = graduate or doctoral.	
Independent business related	Scope of activity	Scope of activity	Geographic Development Company activity		GEO	0 = local 1 = provincial 2 = regional 3 = national 4 = national and international 5 = no answer	“U” of Mann-Whitney Test
	Technological abilities and experience	Technological abilities	Using ICT		ICT	0=No 1=Yes	Chi Square Test
	Business organization	Memberships cooperation networks	Memberships cooperation networks		NET	0=No 1=Yes	
	Cultural	Social values and CSR	Social values and CSR	Survey	SR	0=No 1=Yes	

Source: author-compiled data.

### 4.3. TECHNIQUES USED AND RESULTS

The empirical work is an exploratory statistical study which aims to analyze the significance of the mean difference of the variables set for two independent sub-samples described above. For this, the test has utilized test "t" or "ANOVA" factors, the Mann-Whitney "U" test and finally, the Chi-square test in accordance with the nature of the dependent variable.

This analysis aims to examine whether the two sub-samples show significant differences in the means of certain independent variables, for example, the age of the micro or small businessman



in microenterprises that "innovate" and those that do not. The choice of one type of technique or another depends on the variable to be compared. So for continuous variables ANOVA was used, for ordinal variables the Mann-Whitney "U" test and for nominal variables the chi-square.

These techniques have traditionally been used in the field of business research to compare factors and variables to be considered between two business groups: a group that performs a specific characteristic, as is the case of this study, companies which innovate and those which don't. For example, works such as Calantone et al., (2002) have used the Chi-square to compare the effect of firm age and innovation on two types of companies. Also, you can find studies such as Buesa et al., (2002), which analyzed, by using the ANOVA of the factor, the determinants of innovation in the Spanish regions. In this line of research, Vega-Jurado et al. (2008) have used techniques such as the Mann-Whitney "U" to study how Spanish companies innovate. Other studies such as Vila Alonso et al., (2010) also used this technique to study the relationship between the areas of innovation, financing and firm size, and finally, studies by Vrande et al., (2009) used this technique on issues relating to open innovation in SMEs.

#### 4.4 RESULTS

Tables 3 and 4 present the first results for the descriptive statistics in both the sample and the two independent subsamples:

Table 3. Descriptive statistics.

Variables	N	Min.	Max.	Mean	S.D
INN	148	0	1	0,1824	0,38751
AGE	127	17	63	33,06	8,188
EXP	148	1	50	14,49	7,281
GEN	148	0	1	0,22	0,413
EST	148	1	7	4,45	1,711
GEO	148	0	5	2,09	1,613
ICT	148	0	1	0,26	0,438
NET	148	0	2	0,38	0,732
SR	148	0	1	0,26	0,438

Source: author-compiled data.

Table 4. Descriptive statistics for sub-samples.

Variables	N	Min.	Max.	Mean	S.D
AGE <sub>1</sub>	25	20	63	32,96	10,418
AGE <sub>2</sub>	102	17	51	33,08	7,605
EXP <sub>1</sub>	27	2	32	12,22	6,047
EXP <sub>2</sub>	121	1	50	15	7,457
GEN <sub>1</sub>	27	0	1	0,19	0,396
GEN <sub>2</sub>	121	0	1	0,22	0,418
EST <sub>1</sub>	27	1	7	4,44	1,396
EST <sub>2</sub>	121	1	7	4,45	1,779
GEO <sub>1</sub>	27	0	5	2,11	1,649
GEO <sub>2</sub>	121	0	5	2,09	1,612
ICT <sub>1</sub>	27	0	1	<b>0,48</b>	0,509
ICT <sub>2</sub>	121	0	1	<b>0,21</b>	0,407
NET <sub>1</sub>	27	0	2	<b>0,22</b>	0,506
NET <sub>2</sub>	121	0	2	<b>0,41</b>	0,771
SR <sub>1</sub>	27	0	1	<b>0,48</b>	0,509
SR <sub>2</sub>	121	0	1	<b>0,21</b>	0,407

Source: author-compiled data.

The following tables 5-10 show the results obtained after carrying out the various tests listed above. It compares the average for microenterprises that "innovate" with the average for those that "do not innovate", for each of the variables (shown in Table 2). Subsequently, by performing the corresponding test we have determined whether the differences are statistically significant.

The first analysis in table 5 is the "t" of ANOVA for the two continuous variables, which are: experience and age of the micro-entrepreneur. One drawback of the mean difference analysis, using the test "t" or "ANOVA" is that it assumes the normality of the data processed. However, this drawback is not significant according to the "Central Limit Theorem", which states that if a sample is large enough (usually when the sample size (n) exceeds 30), whatever the distribution of the sample mean, it will follow approximately a normal distribution. That is, given any random variable, if extracted samples are of size n (n > 30) and the sample averages are calculated, those averages will follow a normal distribution. Additionally, the mean is the same as the variable of interest, and the standard deviation of the sample average is approximately the standard error (Channel Diaz, 2006).

Moreover, table 6 describes the Levene test to check whether or not there is homoscedasticity. Given the results were negatives, the Brown-Forsythe and Welch test was carried out in table 7 to give robustness to the results. This is necessary when variances are equal as in the case presented, obtaining the same results.

Table 5. ANNOVA test for micro samples "to innovate" and "do not innovate" regarding continuous variables EXP and AGE.

Variable		Sum of squares	Sig.
EXP	Inter-groups	19,378	0,547
	Intra-group	7773,615	
	Total	7792,993	
AGE	Inter-groups	0,572	0,927
	Intra-group	8446,042	
	Total	8446,614	

Source: author-compiled data.

Table 6: Test of homogeneity of variances.

Variables	Levene statistic	Sig.
EXP	0,862	0,355
AGE	0,050	0,824

Source: author-compiled data.

Table 7: Robust tests for equality of means.

Variables		Statistic	Sig.
EXP	Welch	0,342	0,562
	Brown-Forsythe	0,342	0,562
AGE	Welch	0,007	0,934
	Brown-Forsythe	0,007	0,934

Source: author-compiled data.

Finally, to add strength to the study, the Mann-Whitney U test has been carried out, which is a nonparametric test that is applied to two independent samples. This test is, in fact, the nonparametric version of the Student T test. With such a test the problem of normality of the

sample data will be dealt with, as well as bringing greater consistency to the results. Tables 8 and 9 present the results obtained after performing the test "t" of the mean differences, and the Mann-Whitney test for continuous variables of the study.

Table 8. Mann-Whitney test for micro samples "to innovate" and that "innovate" in relation to the variable AGE.

n <sub>1</sub>	n <sub>2</sub>	U	P (two-tailed)	P (one-tailed)
100	27	1419.5	0.68397*	0.341985*
Normal approx.			0.682148*	0.341074*
z = 0.409533				

Source: author-compiled data.

Table 9. Mann-Whitney test for micro samples "to innovate" and that "innovate" in relation to the variable EXP.

n <sub>1</sub>	n <sub>2</sub>	U	P (two-tailed)	P (one-tailed)
121	27	1823.5	0.34784*	0.17392*
Normal approx.			0.345498*	0.172749*
z = 0.943358				

Source: author-compiled data.

According to the results in tables 5-9 it can be determined that the differences of averages are practically negligible. This means that the difference of averages between firms that "innovate" and those that do not, in relation to the factors of the age of the micro-entrepreneur and the company's seniority are not significant for the development of new products by the Spanish microenterprise.

Moreover, tables 10 and 11 present the analysis for the ordinal variables: AMB, EST and for the nominal variables: GEN, ICT, RS, RED.

Table 10. Mann-Whitney test for micro samples "to innovate" and that "innovate" in relation to the ordinal variables: EST and GEO.

Variables	U de Mann-Whitney	P value
EST	1638	0,982
GEO	1632	0,994

Source: author-compiled data.

Table 11. Chi-square test for micro samples "to innovate" and "do not innovate" in relation to

Variable	Value Pearson Chi-square (gl)	Continuity correction value (gl)	Likelihood ratio value (gl)
GEN	0,188 (1)	0,031 (1)	0,193 (1)
ICT	8,740*** (1)	7,359*** (1)	7,937*** (1)
NET	4,685* (2)	-	5,368* (2)
SR	8,740*** (1)	7,359*** (1)	7,937*** (1)

\* p < 0.1;  
\*\* p < 0.05;

\*\*\* p < 0.01

Source: author-compiled data.

Source: author-compiled data.

Finally, Table 12 shows a summary of the results of the comparison between the two subsamples:

Internal factors in the management of microenterprise	variables studied	Level of significance
Aspects related to the profile of the entrepreneur	AGE	-
	EXP	-
	EST	-
	GEN	-
Other aspects of the use of ICT, organization and corporate culture	ICT	***
	NET	*
	SR	***
	GEO	-

\*  $p < 0.1$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$

Source: author-compiled data

As can be seen, the variables where the means differs significantly between the two independent subsamples are those primarily related to company organization and not to the profile characteristics of micro-entrepreneurs.

## 5. CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH

From the literature studied, it can be concluded that internal factors seem to have more influence on the management of the microenterprise than sector-specific external factors, especially with regard to the innovation intensity of the microenterprise. These internal factors related to the profile of the small businessman and the activity of the micro-enterprise, have been studied in various works, including the one here presented.

This paper has made a comparison between two groups of micro enterprise, namely "innovative" and "non-innovative" to detect those internal factors which explain what the most significant differences between the two are, in a period of global economic crisis. Microenterprises, because of their weaknesses and limitations, find it more difficult to innovate and thus the measurement of these also proves more difficult. For this reason, the study has defined as "innovative" those companies that have developed new products. This presents a number of limitations to the study which will be considered for future research.

The results obtained seem to reveal that the aspects related to the profile of the micro entrepreneur do not have such a differentiating effect on the innovative character of the micro enterprise as those related to the activity and organization of the company.

Specifically, factors related to the use of ICT, organization through business cooperation networks or conducting CSR activities show significant differences between those companies that are innovative and those which are not. However, factors such as age, experience, gender or studies of the micro-entrepreneur do not seem to explain the significant differences in innovative intensity between microenterprises that innovate and those that do not. Although several studies have contrasted the importance of these factors in the innovativeness of enterprises, it is worth mentioning that few studies have examined this issue for the case of micro-enterprises, and this article aims to provide some contributions which have arisen from the analysis and results in a field of research, which is emerging today, and to which more and more attention is being paid.

So, following the line presented by some of the literature reviewed in this paper, there are certain factors such as the use of ICT (Romijn and Albaladejo, 2002; Guzman and Martinez, 2008; Dibrell et al., 2008; Kyvik and the Tarabishy, 2009), understanding and implementing CSR activities (Ahmed, 1998; Guthe et al., 2006; Nieto Fernández Gago and Antolin, 2004), or membership of networks and partnerships (Love and Roper, 1999; MacPherson, 1997; Freel and Robson, 2004; Garcia-Gutierrez-Fernandez et al., 2006), which are triggers for business results and improvement in the competitiveness of enterprises. This study adds to this literature by providing new conclusive data which appears to reveal that these factors are also determinants in explaining the results regarding the innovative process in the field of Spanish micro enterprises.

For a better understanding of the results, it must be specified that the use of ICT, understanding and implementation of CSR activities and membership of cooperative networks and alliances, are also related to the sociological profile of the entrepreneur in the context of the microenterprise. This is justified by the characteristics of the corporate structure in Spain, since it must be remembered, as discussed in this article, that more than fifty percent of them had no more employees than the owner. For this reason it is necessary to understand that the variables identified as significant in the study will also depend on the micro-entrepreneur's performance

and therefore certain factors related to his or her sociological profile, such as education, age, experience or gender.

Finally, future research plans to test the hypothesis using a model which attempts to analyze how different factors contribute to the innovation of micro enterprises, allowing for analysis of which internal factors are most influential and meaningful. It would also be useful to consider the study of new internal variables such as motivational aspects or gender.

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