The habitat of university and non-university startups

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Abstract

The habitat concept is been demonstrated as a crucial environment surrounding startups. The aim of this paper is to examine the differences between startups born in the university and startups born in science parks. Using a multilevel analysis, we compile a unique dataset of 242 Spanish-based technology startups and distinguish between university startups (122) and non-university startups (120). Likewise, demographic profiles and business characteristics are used in the analysis. Consistent with other research, our results indicate that university startups have more opportunities to obtain financial resources and to develop innovations. By contrast, non-university startups involve entrepreneurs with more experience.

Key words: University and non-university startups, entrepreneurship, innovation.

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INTRODUCTION

“What is the best kind of habitat to allow startups to grow?” is one of the recent studied topics in the literature. Authors such as Azarian (2020), Chammassian & Sabatier (2020), Ojaghi et al. (2019) and Oliva & Kotabe (2019) analyse the entrepreneurial habitat of startups, trying to define the competitive advantages of this business type compared to others. In this way, managerial characteristics such as the entrepreneurial profile, the innovation process and the financing resources are identified as differentiating. Startups’ habitat is being explored by researchers from economic, entrepreneurial, and technological viewpoints. Incubators, science parks, industrial or university clusters are some of these habitats where startups are born (Pugliese et al., 2016; Quist et al., 2011; Ghezzi, 2019). These nascent and innovative entrepreneurships are contributing to create jobs and value for countries (Berger & Kuckertz, 2016; Humala, 2015; Fritsch & Noseleit, 2013). Some startups are born in accelerators programmes, in innovative ecosystems such as universities or in specific environments such as science parks. Evidence provided by relevant public institutions, such as NESTA, have shown these innovative and entrepreneurial economies as responsible for the growth of startups in the USA and Europe (Bound, 2011; Aldrich & Yang, 2012). Furthermore, according to the National Business Incubation Association (NBIA) of United States, the business cluster is an economic development tool designed to accelerate the growth and success of businesses through a set of business support resources and services (Hackett & Dilts, 2004).

Twenty years ago, Etzkowitz (1998) defined the “university business” to describe the role of this type of entrepreneurship through the “Triple Helix” model – university–industry–government – and many authors have used this model (O'Shea et al., 2008; Kleinmann, 2010). Nowadays, empirical evidence shows that the power of knowledge-based employment and opportunity has enabled universities to become policy makers through scientific, technological and innovative knowledge produced within their research laboratories (Cai et al., 2019; Zhang et al., 2019; Sà et al., 2019; Ryan et al., 2018). More than two decades ago, authors such as Prodan (2007) and Dorf & Byers (2005) argued

that university entrepreneurs presented different characteristics compared to non-university startups. For example, the motive to create a new business could also distinguish different entrepreneurships associated with university or non-university habitats. Oakey (2003) described three main reasons for starting a new business: 'independence', 'wealth' and 'exploitation'. When these reasons are related to business networks, they can improve the survival and growth potential of new companies (Liao & Welsch, 2003). That could mean that the habitat where startups are born – in the university or in the science parks – would create different entrepreneurships, innovation processes and financing resources compared to the habitat of other businesses.

Given this context, we propose to start answering two questions: Can we identify different demographic profiles for university and non-university startups? Is there any relationship between innovations and access to financing resources?

This paper proposes to analyze the habitat of university and non-university startups (from university or from science parks) identifying entrepreneurial motivation, educational level, financing resources and innovation results (patents). For this aim, we compile a unique dataset of 242 Spanish-based technology startups and distinguish between university startups (122) and non-university startups (120) in 2019.This dataset is obtained from interviews done in the first five years of their nascent entrepreneurship.

The paper proceeds as follows: first, we discuss earlier work on the habitat of startups and its characteristics related to entrepreneurial profile, financing resources and innovation; second, data and methodology are set out; next, we present and discuss our results; and finally, we draw some conclusions and explain the limitations of our research.

1. REVISION OF LITERATURE

The concept of the university startup appeared in the mid-1970s in the European academic world. Recently, European universities have created laboratories and research centers with great capacity to innovate through the creation and

dissemination of technological and scientific knowledge. Their knowledge is patented and sold, developing specialized human resources. In this sense, Technology Transfer Offices (TTO) promote the habitat for university entrepreneurship and commercialize their innovations (patents) (Teixeira & Ferreira, 2019).

Markman et al. (2005) hold that the success of business clusters is derived from the transfer of knowledge from universities to these institutions using the “Triple Helix” model. Thus, the knowledge generated drives the management of the dissemination of this same knowledge, which leads to the motivation of entrepreneurship. This fosters not only competitiveness between companies but also the competitiveness of the regions in which the respective relationships are developed. So, knowledge transfer is linked to business opportunities (Audretsch & Keilbach, 2007).

The importance of TTO in the habitat of university startups is studied by Prokop et al. (2019), who identify four entrepreneurial roles in the habitat of university startups: investors, Technology Transfer Offices (TTO, businesses, incubators and experienced entrepreneurs. On the other hand, Prodan (2007) identifies three university roles linked to new technology-based companies: an educational role, an entrepreneurial role of new high-tech companies and a cooperative role (science parks).

Markowska & Wiklund (2020) show that entrepreneurs who actively build strong ties in their networks or clusters also participate more in joint experimentation activities. In these specific cases, some of the entrepreneurs, suppliers, and members of their local networks jointly experiment with and learn from each other, while the entrepreneurs who retained their past functional networks do not include others in their experimentation.

Startups which have been born in science parks have been defined in this paper as non-academic startups. The science parks provide space for working, training and advising on creative and legal matters. Thus, these clusters focus their efforts on different factors related to the business and to the specific industry (Villalobos, et al., 2016).

On the other hand, university startups can enjoy important advantages in the exploitation of their technological resources, since they are equipped with facilities which belong to university (Colombo & Piva, 2020). In addition, it is likely that internal innovation costs are higher in non-academic startups because these resources are not so directly available.

University startups have lower human resource costs because the partners are still working at the university and can receive a lower salary for their performance. By contrast, non-university startups need financing resources in the beginning to survive (Pe'er & Keil, 2013). But, there are some similarities between university and non-university startups: 1) economic development and local employment opportunities; 2) commercial research; 3) technology transfer; 4) access to resources and equipment (laboratories, sophisticated computers); 5) help to obtain financing; and 6) the supply of real estate equipment.

One of the most important issues in the habitat of startups is how entrepreneurship is developed. According to Ferreira et al. (2019), entrepreneurial spirit or motivation is based on five groups of entrepreneurial theories: (1) the knowledge diffusion theory of entrepreneurship, (2) the theory of creation and networks, (3) decision-making theory, (4) job specialization, (5) entrepreneurship in the informal sector of the economy.

In the case of startups, entrepreneurial motivation is associated with innovation. Monteiro et al. (2019) show that companies can use intangible resources to improve their results, also highlighting the role of business orientation to know how to take advantage of these results (Caseiro & Coelho, 2019).

Singh et al. (2019) investigate how business orientation influences the relationship between technology-based innovation and business orientation. They indicate that technology-based innovation factors are the new practical learning bases, how local solutions and networking capabilities influence business orientation and how it affects the economic and non-economic benefits of business activity. Authors such as Wiklund & Shepherd (2005) and Zhao (2005) have found along two decades ago that there is a relationship between innovation or business orientation. In this sense, startups can be considered as generators

of new ideas and developers of innovation through their network or habitat (university or science park).

Startups are great drivers of innovation and productivity. Many studies find positive evidence of the impact of startups on the economic growth of a region (Audretsch et al., 2006; Gries & Naude, 2008). However, we can see that many of these new companies do not survive the first years of their existence. One the important reason is the financial barriers that stifle and lead to their failure. An important issue for entrepreneurs in their initial stage is obtaining external resources when the asset value of their company is intangible and is based on intellectual property rights (patents, inventions, software, hardware or apps) (Teixeira & Ferreira, 2019). The various alternatives for obtaining initial financing resources include obtaining public aid and contributions from private investors. Competitive advantages based on intellectual property rights define a university entrepreneur. It is widely recognized that a high educational level increases business growth opportunity. It could be considered that entrepreneurs with a higher level of studies have the skills that allow them to identify and exploit new business opportunities (Alemany et al., 2011). Also, education provides the knowledge that can help overcome financial difficulties (Evans & Leigthon, 1989). Other studies show that those companies that have higher rates of job growth have founders with college degrees (Westhead & Cowling, 1995; Almus, 2002). Therefore, the level of training conditions the attitude of individuals to create and start a new business (Coduras et al., 2010).

Following this literature revision, this paper proposes the following hypothesis in our research:

Hypothesis 1 suggests that the demographic profile, especially the education level, is crucial to explain the differences between university and non-university startups.

Hypothesis 2 suggests that the generation of patents is favored by the network of contacts provided by the academic environment, both with other agents.

2. METHODOLOGY

In order to analyze the main differences between the startups' origin (university or non-university), this paper combines various methodologies, ranging from a more general approach to a more specific one. Thus, it is necessary to individually identify which are the descriptive variables of the entrepreneurs and their companies in which there are the greatest differences. For some variables that show statistically significant behaviors, a more detailed analysis will be carried out in order to discover what combination of demographic and business variables explain such behaviors. Finally, the set of variables is considered to find the global factors that explain the relevance between different startups.

2.1. Sample

We have obtained a sample frame from 70 technology transfer offices (TTOs) (from public and private Spanish universities where startups are developed) and from 25 clusters included in the Spanish Association of Science Parks. 242 entrepreneurs (122 non-academic startups and 120 university spinoffs) replied to the proposed questionnaire (January 2019) and their companies were between two and five years old.

Using previous works of authors such as Baum et al. (2001) and Grundy & Welsch (2001), forty variables were identified through a proposed questionnaire, highlighting: demographic data, company's characteristics, motivations to undertake, business experience, education, financing policies and type of growth, as well as issues related to innovation and development. Using the combination of individual and environmental variables, the paper proposes a multilevel analysis for explaining the components and the degree of importance of entrepreneurial activity in these startups.

Regarding the methodology used, descriptive statistics are presented for the variables analyzed, differentiating two groups of startups (university and non-university). The mean and the standard deviation of each register and group are presented, as well as a statistical comparison of the comparison of means in order to determine if there are significant differences between both groups.

2.2. Statistical model

The paper proposes a four-step statistical process which helps to analyze the high number of variables used in the study: first, a descriptive methodology allows university startups and spinoffs to be compared through their mean and their standard deviation; second, two specific variables are studied using a Chi-squared Automatic Interaction Detection regression model (CHAID): generation of patents and access to financing resources; third, a factor analysis is proposed using the Bartlett test in order to identify different entrepreneurial profiles. In this sense, the Varimax rotation is proposed in order to obtain the load matrix of the factors; and finally, the fourth statistical step is a logit regression model in order to determine which factors are the most significant to explain the probability of being a technological company with university support.

With the factors obtained, a logit regression model is proposed in order to determine which factors are the most significant to explain the probability of being a university startup. In this model, the independent variable represents the type of technology company (it adopts the value of 1 in case of university participation and 0 in other cases). The independent variables are represented by a set of factors that summarize the entrepreneurial characteristics (entrepreneurial profile, R+D+i activities, type of product, growth policies, access to private financing).

3. RESULTS AND DISCUSSION

Table 1 shows the main demographic and educational characteristics of startups (university and non-university). In this sense, with respect to the demographic characteristics of the startups' habitat, the results highlight: the average age of entrepreneurs is 35 years and the percentage of women who manage these companies is still very low, below 20% in all cases; entrepreneurial family culture has influence in entrepreneurial motivation (seven out of ten entrepreneurs); previous management experience exercising an economic activity is another important issue: sixty percent of entrepreneurs have managed a company for more than five years; university startups have less business experience compared to non-university startups' entrepreneurs (less than five years).

On the other hand, with respect to the educational level has influence on these categories of entrepreneurship. Nine out of ten university startups are managed by entrepreneurs with university degrees compared to eight out of ten in non-university startups. This difference is even greater if Master's or PhDs are considered (Cohen & Murray, 2019).

Finally, the survey includes questions about the company's location reasons. 41.8% of them have decided to locate near their homes, 23.4% have chosen the location for the cost of the property and infrastructure, 16.8% for proximity to the market niche and the remaining 18% due to proximity to suppliers.

With respect to the activity sector, Table 1 shows five key results: first, most of the companies in the sample come from Information and Communication Technology (ICT) and consultancy services; second, health academic startups are more numerous; third, there are no significant differences in the number of employees of startups (less than nine employees); fourth, networking through clusters has a positive impact on the entrepreneurial activity in the medium term. Likewise, 80% of entrepreneurs made a business plan before starting their business (idea, legal form, production, market resources, market studies and economic forecasting); and, finally, the time elapsed between the idea and the created company is less and more direct in technology-non-university compared with in the case of university startups, which are required to spend more time with the bureaucracy required by the TTOs. However, this period is between one and two years on average in both cases.

On the other hand, Table 1 also analyses type of product and research activities highlighting four results: first, university startups are clearly innovative in the national market and non-university startups are more innovative in the international markets; second, 30% of university startups have registered patent as against 20% of non-university startups (according to the Spanish regulations of the TTOs, it is easier for a nascent entrepreneur to have a patent already registered in order to start working): third, cooperation between university startups is greater than non-university startups (the first ones choose joint ventures as the usual way to compete for European and Spanish Research Projects); and finally, university startups create more innovative activities

(internally and through cooperation) than non-university startups (a university habitat provides access to laboratories and research centers).

Table 1. Demographic profile and business characteristics by category (own work)

(*) Signification less than 5%.

DESCRIPTION	TOTAL		University startup		Non-university startup		Signif.
	Mean	Deviation	Mean	Deviation	Mean	Deviation	
Age	35.51	12.09	35.73	11.61	35.30	12.60	0.779
Gender – % men	0.82	0.383	0.81	0.395	0.84	0.372	0.574
Any family entrepreneur	0.72	0.45	0.74	0.44	0.70	0.46	0.525
More than 5 years working	0.6	0.492	0.53	0.501	0.66	0.474	**0.028***
Educational level (%)							
PhD or Master's degree	42.15%		46.67%		37.70%		**0.001***
Graduate	38.43%		43.33%		33.61%		
Professional background	4.13%		0.83%		7.38%		
Secondary School	15.29%		9.17%		21.31%		
Partners' number	3.06	1.71	1.95	0.18	1.37	0.12	**0.001***
Activity Sector (%)							
Info. Comm. Technology (ICT)	45.45%		51.67%		39.34%		0.351
Consultancy businesses	14.46%		8.33%		20.49%		
Education businesses	2.07%		1.67%		2.46%		
Health businesses	7.44%		12.50%		2.46%		
Other sectors	30.58%		25.83%		35.25%		
Number of employees	8.07	12.39	7.10	7.95	9.02	15.54	0.228
With Business Plan	0.79	0.41	0.79	0.41	0.73	0.45	0.245
Networking through clusters before starting	2.03	0.61	2.02	0.63	2.04	0.59	0.836
Time before starting the business	1.63	0.75	1.67	0.76	1.60	0.73	0.459
Type of product at the entrepreneurial time and R+D+i activities							
Innovative in the national market	31.82%		44.17%		19.67%		**0.006***
Innovative in the international market	35.12%		26.67%		43.44%		
Good results in both markets	24.49%		21.67%		27.87%		
Current market	8.26%		7.50%		9.02%		
Internal R+D activities	0.52	0.50	0.66	0.48	0.38	0.49	**0.000***
External R+D activities	0.32	0.47	0.38	0.49	0.25	0.44	**0.031***
Innovation by cooperation	0.70	0.46	0.79	0.41	0.61	0.49	**0.001***
Patents	0.23	0.42	0.29	0.46	0.17	0.38	**0.030***

Table 2. Entrepreneurial motivations and business issues (own work).

(*) Signification less than 5%.

	TOTAL		University startup		Non-university startup		TOTAL
DESCRIPTION	Mean	Deviation	Mean	Deviation	Mean	Deviation	
Motivational variables (Likert scale: 1 = "nothing important" a 5 = "very important")							
Work for oneself	4.05	0.98	3.88	1.10	4.21	0.83	**0.007***
Have more free time	2.20	1.17	2.03	1.09	2.37	1.22	**0.025***
Choose the work location	2.90	1.36	2.83	1.45	2.96	1.28	0.479
Prioritize family life	2.89	1.29	2.73	1.39	3.05	1.16	**0.050***
Self-realization	4.41	0.75	4.50	0.66	4.32	0.82	0.066
Corporate Social Responsibility	3.87	1.07	4.02	1.03	3.72	1.10	**0.027***
You own boss	3.69	1.10	3.56	1.13	3.83	1.05	0.060
Accept a challenge	4.26	0.93	4.34	0.88	4.19	0.96	0.199
Display personal skills at work	2.98	1.19	2.91	1.15	3.04	1.24	0.389
Social position	2.57	1.10	2.48	1.09	2.66	1.10	0.189
Enough income level	3.33	1.10	3.24	1.14	3.40	1.06	0.258
High income levels	3.00	1.17	2.96	1.19	3.05	1.15	0.546
Relationship between income and effort	3.55	1.18	3.41	1.21	3.70	1.13	0.056
Resource managements and tools (Likert scale: 1 = "nothing important" a 5 = "very important")							
Web place	4.39	0.78	4.38	0.83	4.40	0.72	0.830
Online shopping	3.38	1.33	3.46	1.32	3.30	1.34	0.327
Online sales	3.20	1.49	3.15	1.50	3.25	1.49	0.583
Brand image through social media	3.84	1.08	3.81	1.11	3.87	1.07	0.673
Business issues (Likert scale: 1 = "nothing important" a 5 = "very important")							
Appropriated product to the market	4.37	0.63	4.38	0.64	4.37	0.63	0.890
Financial resources	3.34	1.16	3.53	1.15	3.15	1.15	**0.010***
Good market expectations	3.93	0.86	3.99	0.81	3.86	0.91	0.238
Good corporate and organizational culture	3.91	0.84	3.86	0.82	3.97	0.85	0.316
Technological effort and dedication	4.64	0.73	4.72	0.58	4.57	0.84	0.100
Constant innovation	4.53	0.75	4.64	0.55	4.42	0.89	**0.022***
Production	4.01	0.98	4.03	0.98	3.98	0.98	0.695
Marketing	4.16	0.91	4.15	0.86	4.16	0.97	0.897
Sales place	3.67	1.29	3.69	1.31	3.66	1.28	0.895
Relations with suppliers	3.85	1.07	3.78	1.16	3.92	0.97	0.303

The results about entrepreneurial motivations, development decisions and survival factors are included in Table 2 and we can pick out two conclusions: first, entrepreneurs of university startups value their social contribution through their work and have not taken into account other motivations, such as working for oneself or having more free time; and second, entrepreneurs of non-university startups prefer to enjoy more free time and social activity.

Following the proposed four-step statistical process, we apply a CHAID regression model in order to explain the characteristics of the habitat of startups. In this sense, the paper considers the generation of patents as an independent variable and the rest of the variables explained in the previous section as dependent variables, as well as other variables related to access to financing sources (see Table 3). We highlight four results (see Table 3): (1) 22.7% of the total companies surveyed have patents, although if companies have external financing resources (bank or similar), the percentage of companies with patents increases to 32.5%. This means that an intangible asset, as patent or industrial property, serves as a guarantee when accessing external financing; (2) in the case of companies without private financing, the percentage is reduced to 12.1%; (3) the patent creation reduces to 10.9% in the case of companies without private financing and Master's or PhD degrees; and (4) other variables as product development policies and business experience explain how the percentage of registered patents is reduced.

It is also important to explain access to financing channels by startups, distinguishing three types of financing resources: external own funds, external funds and public financing (for example, through European projects). In this sense and following the results of Table 3, we can conclude that: (1) just 16.1% of all companies surveyed have access to all three forms of financing; (2) the variables that explain the greater access to financing resources are the type of growth way, the business culture and the selected product; (3) the percentage of companies with the three forms of financing identified is higher when growing by cooperative forms as joint ventures; and (4) companies with a strong management culture as a consequence of a business development through greater human resources power have better access to financing resources.

Table 3. Analysis of patents: main characteristics (own work).

(*) Signification less than 5%.

% Companies with patents	
With patents	Without patents
55 (22.7%)	187 (77.3%)

Without private financing		With private financing	
Yes: 14 (12.1%)	No: 102 (87.9%)	Yes: 41 (32.5%)	No: 85 (67.5%)

Without PhD		With PhD	
Si: 12 (10.5%)	No: 85 (89.5%)	Yes: 2 (100%)	No: 0 (0%)

Without product development		With product development	
Yes: 2 (2.8%)	No: 69 (97.2%)	Yes: 10 (23.3%)	No: 33 (76.7%)

Latency time ≤ 2 yrs	Latency time > 2 yrs
No: 67 (100%)	Yes: 2 (50%) No: 2 (50%)

The third step in the proposed statistical process is a factor analysis using the Bartlett Test in order to identify different entrepreneurial profiles. In this sense, the Varimax rotation is proposed in order to obtain the load matrix of the factors. The significance of the Bartlett Test, with a Chi square with 741 degrees of freedom, results in a level of significance of p = 0.0000, which means linear relationships between the variables and an appropriate factor analysis. Table 4 presents the factors obtained, specifically 13 factors, which include 63.83% of the variance of the original variables. The main results are explained as follows:

(1) The most important explanatory factor is that which includes the variables associated with the process of “digitalization” (website, online purchases and social networks).
(2) This digitalization factor explains 6.74% of the total variance.
(3) The second factor is that which brings together the motivations related to “obtaining income”, which explains 6.82% of the total variance, including variables such as income vs effort.
(4) The third factor, which explains 5.9%, includes three variables associated with technology, innovation and development, which is logical given the

type of company surveyed. Growth by cooperation is presented as necessary in order to increase know-how and background.

(5) The fourth, fifth and seventh factors (5.98%, 5.46% and 4.20% respectively) are associated with social elements, such as: “quality of life” (having free time or prioritizing family life), “personal recognition” (achieving self-realization) and “social recognition” (exhibiting social skills). In this sense, personal self-fulfillment is satisfied through creating social value.

(6) The sixth factor, with 3.36% of the total variance, refers to the location within a cluster. The included variables in this factor (valuation of the business culture and impact in the cluster) have a negative relationship, which shows that a strong business culture is needed to survive in the short term; cluster networking is most important than corporate culture in the long term.

(7) The eighth (4.07%) and ninth factors (4.48%) consider elements associated with the experience. The eighth factor considers two variables: business activity experience as positive and business plan as negative. Businesses with managerial experience have less motivation for long-term planning.

(8) The ninth factor relates the entrepreneur’s age, suitable product and educational level. Older entrepreneurs with highest educational level assess the added value of any business model to a greater extent. In certain sectors, especially technological ones, experience becomes an essential element to undertake (Ramayah & Ahmad, 2012; Matlay, Mohamad, Lim & Yusof, 2015).

(9) The tenth factor (5.02%) considers external aspects such as the activity’s sector, relationship between suppliers and customer distribution channels.

(10) The eleventh factor (5.04%) considers an assessment of the elements that are considered necessary to achieve business survival, such as the availability of financial resources, market expectations and lean production. Spinoffs are usually technological with easy financial access due to higher innovation degree.

(11) The twelfth factor (3.35%) is formed by a single variable and represents the time between the initial idea and starting the business.

(12) The last factor (3.41%) has been titled ‘growth factor’ due to two significant variables – patents and human talent employed – both with a positive relationship.

Table 4. Factor Analysis of Entrepreneurial Behaviours (own work).

Factorial analysis. Analysis of entrepreneurial activity.	Digitization	Income	Innovation	Quality of work life	Social recognition	Location	Personal recognition	Professional experience	Experience in business	Sector	Efficiency factors	From idea to reality	Growth	Commlt.
Marketing	0.498													**0.629**
Web place	0.736													**0.611**
Online shopping	0.583													**0.481**
Online sales	0.777													**0.652**
Brand image through social media	0.739													**0.672**
Work for oneself		0.406												**0.640**
Self-realization		0.770												**0.751**
Enough income level		0.840												**0.761**
Relationship Income and effort		0.812												**0.695**
Constant innovation			0.729											**0.677**
Technological effort, dedication			0.792											**0.702**
Joint venture			0.562											**0.769**
Have more free time				0.760										**0.677**
Choose the work location				0.808										**0.702**
Prioritize family life				0.835										**0.769**
Achieve personal self-realization					0.690									**0.568**
Corporate Social Responsibility					0.525									**0.570**
Accept a challenge					0.710									**0.631**
Clusters strengthened business						-0.765								**0.659**
Good organizational culture						0.421								**0.558**
Display personal skills at work							0.763							**0.687**
Get social recognition							0.705							**0.679**
Your own business								0.492						**0.729**
Professional Experience								0.717						**0.619**
Did you make a Business Plan?								-0.409						**0.622**
Age									0.684					**0.677**
Educational level									0.678					**0.644**
Product appropriate to the market									0.528					**0.597**
Sector										0.521				**0.646**
Relations with suppliers										0.716				**0.676**
Sales place										0.660				**0.612**
Production											0.476			**0.525**
Financial resources received											0.389			**0.641**
Good market expectations											0.619			**0.572**
The family business tradition											0.655			**0.724**
Time from idea to foundation												0.808		**0.638**
Employees number													0.729	**0.639**
Do you have a patent?													0.403	**0.590**
% of Variance	**6.74%**	**6.82%**	**5.90%**	**5.98%**	**5.46%**	**3.36%**	**4.20%**	**4.07%**	**4.48%**	**5.02%**	**5.04%**	**3.35%**	**3.41%**	
% of cumulative Variance	**6.74%**	**13.56%**	**19.46%**	**25.44%**	**30.90%**	**34.26%**	**38.46%**	**42.53%**	**47.01%**	**52.03%**	**57.07%**	**60.42%**	**63.83%**	

Table 5 summarizes the comparison between university and non-university through a Logit model: the type of company is the independent variable (1 if the company is a university startup or 0 if it is a non-university startup) and the dependent variables are formed by: explanatory factors of entrepreneurial profile, internal and external R+D+i activities, type of product (innovative or not in the national/international market), growth policies and access to private financing.

Table 5. Logit Binary Regression Model (own work)

(*) Significative less than 5% and Odds value is not 1.

Variables in the Logit equation	Coeficients	St. Error	Signf.	Odds value
	University / Non-University Startup	**University / Non-University Startup**	**University / Non-University Startup**	**University / Non-University Startup**
FACTOR 1: Digitization	0.072	0.155	0.644	1.074
FACTOR 2: Obtaining income	-0.151	0.153	0.323	0.860
FACTOR 3: Innovation	0.457	0.185	**0.013***	**1.580***
FACTOR 4: Quality of work life	-0.220	0.151	0.147	**0.803***
FACTOR 5: Social recognition	0.244	0.153	0.110	**1.276***
FACTOR 6: Location	0.055	0.152	0.719	1.056
FACTOR 7: Personal recognition	-0.073	0.151	0.627	0.929
FACTOR 8: Professional Experience	-0.399	0.151	**0.04***	**0.733***
FACTOR 9: Experience in business management	0.075	0.172	0.664	1.078
FACTOR 10: Sector	-0.217	0.155	0.161	**0.805***
FACTOR 11: Efficiency factors	-0.192	0.150	0.203	0.826
FACTOR 12: From idea to reality	0.014	0.147	0.924	1.014
FACTOR 13: Growth	0.215	0.152	0.158	**1.240***
International or national product innovation	-1.083	0.339	**0.001***	**0.339***
Private financing	-0.335	0.358	0.349	**0.715***
Business growth, business volumen	-1.693	0.652	**0.009***	**0.184***
Internal R+D	0.615	0.363	0.090	**1.851***
External R+D	0.290	0.309	0.348	**1.337***

Firstly, we present the case of the analysis of university startups. Factors that explain a greater probability of encountering a university startup are the capacity for innovation and collaboration with other companies, as well as the innovative international orientation of their products.

According to Odds Ratios, when a business presents an innovation factor (innovation, technological effort and joint venture), there is a 58 per cent probability of being a university startup and a 66 per cent probability in the case of innovation in the product. On the other side, there is a negative relationship between professional experience factor and growth expectations. In this sense, using Odds Ratios once more, there is 27 per cent less probability of being a university startup when the entrepreneur's professional experience is lower and 18 per cent less probability in the case of growth expectations. These results fit with the previous conclusions because the entrepreneurs in university startups are mostly university professors with legal permission to work in their company. In many cases, this business is a bridge to obtain a patent and exploit it.

Regarding the use of technological tools and resource management, entrepreneurs in university and non-university startups consider social networks and webpage as important tools in their external position. Other aspects such as technological effort, lean production as well as constant innovation are valued by both kinds of entrepreneurs. But innovation is more valued by entrepreneurs in university startups. On the other hand, the provision of financing resources is the lowest valued for the survival of the company, although university startups consider this as very important.

In this way, the findings of Markowska & Wiklund (2020) provide evidence that, regardless of the existence or lack of prior business knowledge, entrepreneurs go through a concentration phase in which they either replicate their own previous behavior or model the behaviors of their employees. Therefore, the initial focus on modeling helps entrepreneurs to reduce the complexity of the task and satisfy their need to belong to a community or cluster where they can point out their origins and belonging.

4. CONCLUSIONS AND LIMITATIONS

This study provides a fresh look at the personal and professional characteristics of entrepreneurs in university and non-university startups. Two contributions of this paper are highlighted: first, non-university startups present greater professional experience. These entrepreneurs have acquired previous

experience in other jobs and have decided to implement their knowledge in a new company. For that reason, their greater sector knowledge provides innovation abilities for competing in the international market. The motivations of this kind of entrepreneurship are to develop a new deal through a new company and to enjoy family and work life at the same time; and second, entrepreneurs in university startups are characterized by higher levels of education. Their networking generates more relationships with university companies. Greater internal and external research and development is created closely linked to greater access to alternative financing resources such as through European partners. Their motivation is based on an innovation cycle with a higher percentage of patents. In summary, both university and non-university startups go through the same hosting cluster and have very similar business networks.

This paper presents two limitations: firstly, the definition of the university startup includes only tech entrepreneurs with less than five years of living. In this sense, the conclusions of this study cannot apply to other cases included in the general startup concept; and secondly, businesses' investment returns have not been considered because this paper analyzed only entrepreneurial characteristics without assessing financial issues. So, in future research this study could be developed according to these considerations.

Finally, this paper offers new perspectives for studying the habitat of startups which could be developed by academicians and practitioners. The synergies between experts from both types of business could enhance the startups' knowledge depending on the habitat (university or non-university) where the entrepreneurship occurred.

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