

# Entrepreneurial success and its determinants: the case of Spain<sup>\*</sup>

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## Introduction

Entrepreneurs are the main driving force of economic activity, so economic development mainly depends on the quantity and quality of them. It is to say, the most economically developed nations have become so because they have had more and, specially, better entrepreneurs and enterprises. So, if we admit this statement and we want to improve economic development, we should try to promote entrepreneurial activity. To do this, we need firstly to define the factors that determine it. But this is not easy. Otherwise, we would have the key to economic development.

Some great economists like Schumpeter, Knight and others have thought and written about the entrepreneurial function, and thanks to them we can better understand it and its importance. Following these pioneers, other economists, sociologists and economic historians have since more recently been doing empirical studies to contrast the theories and to get more specific and detailed conclusions<sup>1</sup>. This paper intends to make a contribution in this sense.

Our study aims to obtain a measure of entrepreneurial success and to look for the factors that determine it. To do that we have constructed a database of Spanish entrepreneurs with data related to entrepreneurial success on the one side (business longevity, internationalization, size, technological level, number of sectors), and to some variables that could contribute to explain such success, on the other (innovation activity, education, geographical origin, family business tradition, age and date of their beginning as entrepreneurs). To obtain these data we have mainly used some biographical dictionaries and the historical database of the Spanish Patent Office, where we have looked for the inventions patented by the entrepreneurs and their companies.

Specifically, this study is focused on the 100 most important Spanish entrepreneurs of the 20th century and the 46 most significant Galician –the North-West Spanish region– ones<sup>2</sup>. Four of them are shared by both samples, what means that the complete list consists of 142 entrepreneurs, whose biographies have been published in two different dictionaries<sup>3</sup>. Although the entrepreneurs included in these publications have been selected by experts and with scientific criteria, other significant entrepreneurs have been excluded, so the sample is not free of a certain bias. In addition, the dictionaries only include successful entrepreneurs, which introduces another bias<sup>4</sup>. These biases impose certain limits to the study, but, as this is the only systematic available information, we have to cope with them. Nevertheless, the sources have many possibilities, as we will show.

The paper has three sections. The first one contains a description of the Spanish entrepreneurs according with the characteristics we have considered that can determine entrepreneurial success. The second section presents a view of the same entrepreneurs' success in relation with the factors we have considered to be indicators of entrepreneurial success. In the third,

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<sup>\*</sup> I am grateful to Gabriel Tortella for his valuable suggestions to this draft.

<sup>1</sup> For a compilation of many classic and significant recent works about the matter, see Shane (ed.) (2002). For more recent studies, see García Ruiz and Toninelli (eds.) (2010) and Naudé (ed.) (2011).

<sup>2</sup> This is the first output of an ongoing project that aims to widen the database to the most significant modern Spanish entrepreneurs, whose biographies have recently been or will be soon published.

<sup>3</sup> Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009).

<sup>4</sup> That is inevitable, as only successful entrepreneurs are usually recorded, while those who fail are more easily forgotten. For a wider discussion about the limits and virtues of the source, see Tortella *et al.* (2011), pp. 128-9.

as a conclusion, there is a provisional exercise that tries to check to what point the variables presented in the previous sections are related.

### 1. Some features of the Spanish entrepreneurs possibly determinant of their success

To begin with the description of the characteristics of the entrepreneurs of our samples, let us define their time coordinates. As table 1 shows, they were born between 1749 and 1946. The Galician entrepreneurs were more smoothly distributed over the two centuries because that dictionary is not specifically focused on the 20<sup>th</sup> century as the other one. Anyway, it is clear that the bulk of the entrepreneurs in both samples were born in the second half of the 19<sup>th</sup> century.

Table 1. Year of Birth of the 100 Spanish and 46 Galician entrepreneurs.

Birth year	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
From 1749 to 1799	-	-	3	6,5	3	2,1
From 1800 to 1849	9	9,0	13	28,3	22	15,5
From 1850 to 1899	59	59,0	21	45,7	79	55,6
From 1900 to 1936	31	31,0	9	19,6	37	26,1
From 1937 to 1946	1	1,0	-	-	1	0,7
TOTAL	100	100,0	46	100,0	142	100,0

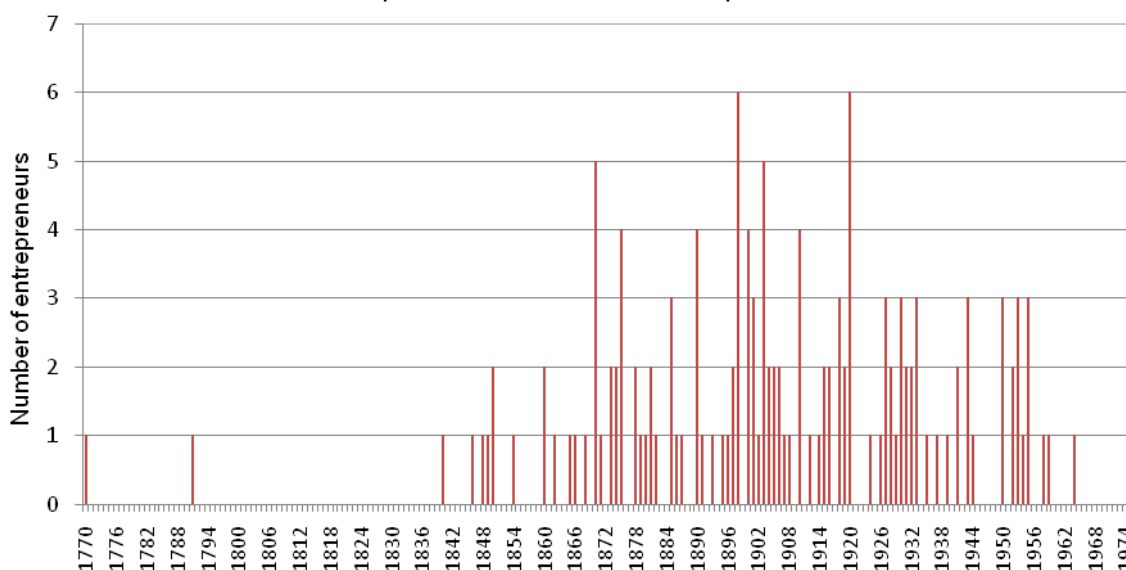
Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009).

Table 2. Date of beginning of the entrepreneurial activity of the 100 Spanish and 46 Galician entrepreneurs.

Beginning of the entrepreneurial activity	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
From 1770 to 1849	1	1,0	5	10,9	6	4,2
From 1850 to 1899	30	30,0	21	45,7	51	35,9
From 1900 to 1939	47	47,0	19	41,3	63	44,4
From 1940 to 1976	22	22,0	1	2,2	22	15,5
TOTAL	100	100,0	46	100,0	142	100,0

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009).

Figure 1. Year of beginning of the entrepreneurial activity of the 20<sup>th</sup> century 100 Spanish and 46 Galician entrepreneurs.



Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009)

Other interesting temporal feature is the date the entrepreneurs properly began their activity, a date which, obviously, is very much related with their birth date (table 2 and figure 1). Again, the Galician ones were more homogeneously distributed over time, but the majority of them began as entrepreneurs in the second half of the 19<sup>th</sup> century, while de 100 Spanish entrepreneurs mainly started out in the first third of the 20<sup>th</sup> century. This information is important for our analysis because the development of the Spanish economy as well as the social and institutional changes in the country throughout time may have significantly influenced the entrepreneurial activity and its success.

The age at which the entrepreneurs began to be so is another piece of information to take into account because it is one of the variables frequently considered to influence entrepreneurship or entrepreneurial success. A recent survey among Spanish entrepreneurs<sup>5</sup> has shown that in most cases they have began their business activities in their twenties. As table 3 shows, this was exactly the case in our samples: around 80 per cent of the Spanish and Galician entrepreneurs began their activity before their thirties. Therefore, this seems to be a constant over time and its importance on entrepreneurial success needs to be evaluated.

Table 3. Age at which the 100 Spanish and 46 Galician entrepreneurs began their entrepreneurial activity.

Age of beginning of the entrepreneurial activity	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
24 years of age or less	37	37,0	24	52,2	59	41,5
25-30 years of age	39	39,0	16	34,8	54	38,0
31-39 years of age	19	19,0	4	8,7	23	16,2
40 years or more (until 56)	5	5,0	2	4,3	6	4,2
TOTAL	100	100,0	46	100,0	142	100,0

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009).

The question about the importance of the family background for entrepreneurship has been quite studied and debated, but its influence on entrepreneurial success is not very clear, as there have been many successful self-made entrepreneurs. Nevertheless, it is also certain that a family business tradition can be a certain advantage for beginning entrepreneurs. But it is not an easy variable to grasp as it has diverse aspects –time, strength of the familiar ties, financial support, etc.– not all measurable. This is why we have used for this study a reductive definition of family business tradition as the number of years passed between the beginning of the ancestors' and of our entrepreneurs' business activity. As table 4 shows, the majority of them (66 per cent) began on the basis of a business previously established by their ancestors. Nevertheless, almost 34 per cent were self-made entrepreneurs: a significant amount that indicates that family tradition is not essential for entrepreneurial success. The question is whether the difference in success between the two groups was significant or not. We will try to answer this later on.

Table 4. Family business tradition of the 100 Spanish and 46 Galician entrepreneurs (Number of years).

Years from the beginning of family business to the entrepreneur's activity	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
More than 150 years	2	2,0	2	4,3	4	2,8
Between 100 and 149 years	5	5,0	5	10,9	9	6,3
Between 50 and 99 years	18	18,0	4	8,7	22	15,5
Less than 50 years	42	42,0	19	41,3	59	41,5
No tradition (self-made entrepreneurs)	33	33,0	16	34,8	48	33,8
TOTAL	100	100,0	46	100,0	142	100,0

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009).

<sup>5</sup> *Observatorio de Clima Emprendedor 2011* (<http://iniciador.com/aaobservatoriodeclimaemprendedor/>).

The role of education in entrepreneurial activity is another important topic under study and debate. Has the entrepreneurs' education been a significant determinant of their success? In this case, what type of education is more important for entrepreneurship? These are the kind of questions about the matter that we would like to answer. For that, we have included in the database a classification of the entrepreneurs according to the level of studies they fulfilled<sup>6</sup>. As table 5 shows, the educational level of the Galician entrepreneurs was much lower than that of the 20<sup>th</sup> century Spanish selected entrepreneurs: University studies were predominant among the latter, while the majority of the former did not have any kind of studies. If been included among the 100 great Spanish entrepreneurs of the 20<sup>th</sup> century is a sign of special success, this could be a first evidence of the importance of education for entrepreneurial activity. But we cannot overlook the significant amount of successful entrepreneurs (more than 30 per cent if we consider those with unknown level of studies) that did not have any formal education, so it could also be said that education is not indispensable for entrepreneurial success. The subsequent quantitative analysis of the data will try to obtain more conclusive answers to this question.

Table 5. Educational level of the 100 Spanish and 46 Galician entrepreneurs.

Level of studies	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
1. No studies	13	13,0	12	26,1	24	16,9
2. Unknown	11	11,0	8	17,4	19	13,4
3. Apprenticeship	10	10,0	9	19,6	19	13,4
4. Secondary studies	2	2,0	4	8,7	6	4,2
5. Various university studies	2	2,0	-	-	2	1,4
6. Law/Economics	36	36,0	9	19,6	42	29,6
7. Science	3	3,0	2	4,3	5	3,5
8. Engineering/Architecture	23	23,0	2	4,3	25	17,6
TOTAL	100	100,0	46	100,0	142	100,0

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009).

At least since the times of Montesquieu, many social scientists have discussed about the incidence of geography on political and socio-economic development. Although some recent influential studies have reduced the importance of geography for economic development in favor of institutions<sup>7</sup>, others continue cleverly arguing in its favor<sup>8</sup>. Even though, explicit studies about the influence of geography on entrepreneurship are not abundant, so –given the interest of this debate– a contribution in this sense can be useful. This is why we have also collected data about the geographical origin of the entrepreneurs and/or their families. As table 6 shows, we have grouped the 17 Spanish regions in seven groups according to their proximity and ordered them from the less (level 1) to the most (7) economically developed, and we have given the maximum value (8) to the group of foreign origin, as they came mainly from France and the UK. If we put apart the Galician entrepreneurs –specially biased in relation with this variable for obvious reasons– and consider only the 20<sup>th</sup> century Spanish selection, it is evident that the regions that contributed with more entrepreneurs were Catalonia (24) and the Basque Country (21), followed by the four-regions group formed by Asturias, Galicia, Cantabria and Castilla-León (19). Of course, if we weighed these data by population, the latter group would worsen its position, but Catalonia and the Basque Country would hold the lead. In any case, all regions 'produced' successful entrepreneurs, so there were not insuperable geographical impediments for entrepreneurship. The question is if the different regional (or foreign) origin of the entrepreneurs determined different levels of success. We will try to answer it later on.

<sup>6</sup> These data have been provided to me by Gabriel Tortella and Gloria Quiroga. I thank them for their generosity.

<sup>7</sup> E.g. Acemoglu (2009), chapters 1 and 4.

<sup>8</sup> E.g. Diamond (2009).

Table 6. Geographical origin of the 100 Spanish and 46 Galician entrepreneurs.

Region of origin of the entrepreneur's family	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
1. Southern regions (Andalucía, Extremadura, Murcia, Castilla-La Mancha, Canarias)	6	6,0	1	2,2	7	4,9
2. Northwestern regions (Asturias, Galicia, Cantabria, Castilla-León)	19	19,0	36	78,3	52	36,6
3. Aragón, Navarra, La Rioja	4	4,0	2	4,3	6	4,2
4. Valencian Community, Balearic Islands	9	9,0	-	-	9	6,3
5. Madrid	7	7,0	-	-	7	4,9
6. Basque Country	21	21,0	-	-	21	14,8
7. Catalonia	24	24,0	4	8,7	28	19,7
8. Europe (UK, France)	10	10,0	3	6,5	12	8,5
TOTAL	100	100,0	46	100,0	142	100,0

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009).

The relation between innovation, entrepreneurship and economic development has received growing attention since the pioneer contributions of Schumpeter. As a result, the idea that innovation is one of the keys to economic development is nowadays generally accepted by economists and politicians. It is essential, therefore, to include the variable innovation in our study about the determinants of entrepreneurial success. To measure the technological innovation activity, we have looked for all the patents registered by the entrepreneurs and their companies, as well as their ancestors, descendants and associates, in the historical database of the Spanish Patent Office from 1826 to 1966<sup>9</sup>. But neither all innovations are patented nor are necessarily or strictly 'technological'. This is why we have also used the biographical dictionaries to collect the non patented inventions as well as other types of innovations, such as commercial or organizational, made by the entrepreneurs.

Table 7. 100 Spanish and 46 Galician entrepreneurs ordered by number of patents applied for from 1826 to 1966.

No of patent applications	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
None	20	20,0	26	56,5	46	32,4
Between 1 and 5	23	23,0	6	13,0	28	19,7
Between 6 and 10	15	15,0	6	13,0	21	14,8
Between 11 and 20	12	12,0	2	4,3	14	9,9
Between 21 and 30	9	9,0	4	8,7	11	7,7
More than 30	21	21,0	2	4,3	22	15,5
TOTAL	100	100,0	46	100,0	142	100,0

Source: Spanish Patent Office.

Table 8. Number of patent applications from 1826 to 1966 by the 100 Spanish and 46 Galician entrepreneurs.

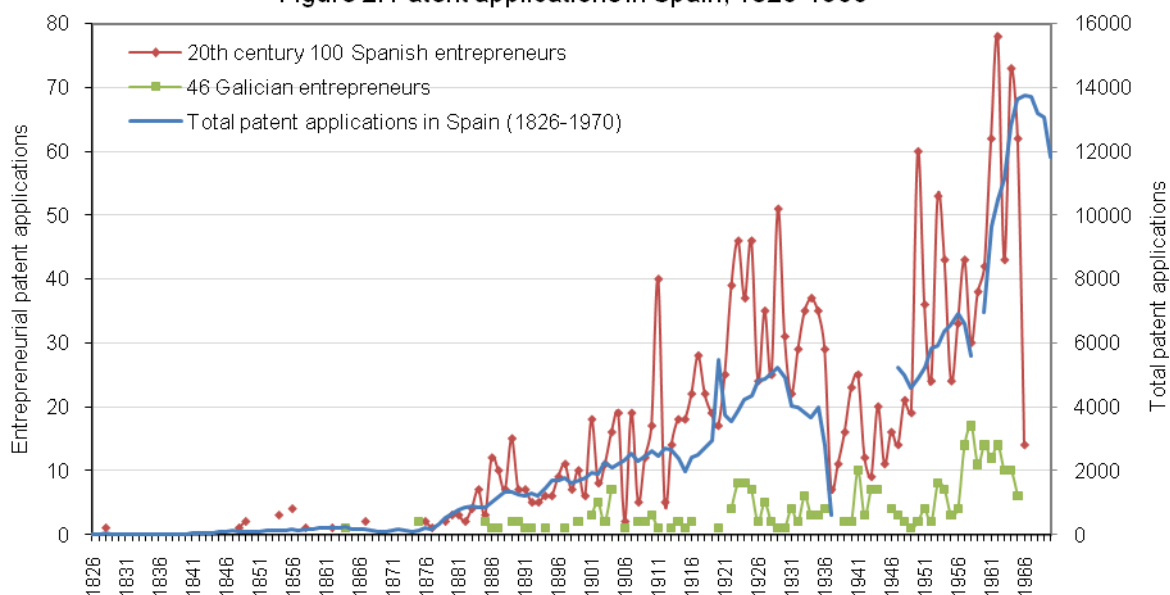
Sample	No of entrepreneurs	No of patents	No of patents by entrepreneur	No of patents by entrepreneur with patents
20th century Spanish selection	100	2003	20,0	25,0
Galician entrepreneurs	46	289	6,3	14,5
TOTAL	146	2292	15,7	22,9

Source: Spanish Patent Office.

<sup>9</sup> This is the last year included in the database, so from 1966 onwards we have no information of the patents registered by our entrepreneurs or their companies, which is a significant limitation of this source. In spite of this, it is also true that we have patent information for almost all the 19<sup>th</sup> century and two thirds of the 20<sup>th</sup> century, the main period of activity of the entrepreneurs of our samples.

According with the number of patent applications (table 7), 32.4 per cent of the entrepreneurs of our samples were not innovative, as they did not register any patent. It is remarkable that the Galician entrepreneurs were much less innovative (56.5 per cent of them did not apply for any patent) than the selected 20<sup>th</sup> century Spanish entrepreneurs (only 20 per cent did not register any patent). If we assume that the latter were more successful as entrepreneurs, this can be a first evidence of the positive influence of technological innovation in entrepreneurial success. Table 8 reflects the total number of patents applied for by the two groups and the average number by entrepreneur, which confirms that the Galician entrepreneurs clearly had a lower technological level than de 20<sup>th</sup> century selection.

Figure 2. Patent applications in Spain, 1826-1966



Sources: Spanish Patent Office and Ortiz-Villajos (1999), Appendix 1.

Figure 2 shows the temporal distribution of the patents applied for by both samples of entrepreneurs as well as the total number of patent applications in the Spanish Patent Office from 1826 to 1970. The evolution of patent applications approximately reflects what happened with the Spanish economy: the expansion in the 1850s and the subsequent crisis; the slow growth before World War I and the rapid expansion of the twenties; the profound depression of the thirties and early forties; and the extraordinary growth of the sixties<sup>10</sup>. It is also clear that the entrepreneurial patents – especially those of the 20<sup>th</sup> century 100 Spanish entrepreneurs– followed the same trend as the overall applications, with the only significant difference that the rises and drops were sharper in the former. This is not surprising as businessmen are supposed to be more sensitive to market changes.

As we have said, among the entrepreneurial patents we have included not only those directly applied for by the entrepreneurs, but also by their companies, families and associates, provided that they were related with the entrepreneurs' businesses. Table 9 summarizes this information for the patents related to the entrepreneurs of our two samples<sup>11</sup>. We have classified the relationship of the patentees with the entrepreneurs in 20 categories. A detailed analysis of these data can help to characterize the innovation strategy of the entrepreneurs, but we cannot go into this topic in any depth at this moment. We want just to point out that the most striking aspect of these data is that the bulk of patents were applied for on behalf of the entrepreneurs' companies. This was so for both samples, but

<sup>10</sup> For a more detailed explanation of these stages and the differences between the evolution of GDP and patent applications in Spain, see Ortiz-Villajos (2009), pp. 317-321.

<sup>11</sup> The total number in this table is superior to the number of patent applications (see table 8) because some patents were applied for by more than one patentee.

more for the Galician entrepreneurs. The entrepreneurs appeared as patentees only in around 12 per cent of the applications, so to measure their innovative activity it is absolutely essential to consider also all the other patents related with them.

Table 9. Relationship with the entrepreneur of the applicants (patentees) of the 100 Spanish and 46 Galician entrepreneurs' patents (1826-1966).

Relationship with the entrepreneur	Spanish entrepreneurs (No of patentees)	%	Galician entrepreneurs (No of patentees)	%
Entrepreneur	269	12,2	40	12,9
Son	60	2,7	34	10,9
Grandson	7	0,3	3	1,0
Father	26	1,2	1	0,3
Grandfather	40	1,8	-	-
Brother	16	0,7	2	0,6
Uncle/Cousin/Nephew	8	0,4	-	-
Spanish associate	27	1,2	21	6,8
Foreign associate	3	0,1	5	1,6
Inventor-associate (Spanish)	112	5,1	7	2,3
Inventor- associate (foreigner)	137	6,2	-	-
Foreign firm ceding license	89	4,1	13	4,2
Own Spanish company	862	39,3	179	57,6
Own Spanish company (Ancestors)	37	1,7	-	-
Own Spanish company (Successors)	105	4,8	4	1,3
Own Spanish/foreign company	165	7,5	2	0,6
Own foreign company	20	0,9	-	-
Associate Spanish company	16	0,7	-	-
Associate foreign company	22	1,0	-	-
State Spanish company	175	8,0	-	-
<b>TOTAL PATENTEES</b>	<b>2196</b>	<b>100,0</b>	<b>311</b>	<b>100,0</b>

Source: Spanish Patent Office.

Table 10. Patent applications by the 100 Spanish and 46 Galician entrepreneurs classified by type of patent (1826-1966).

Type of patent	Spanish entrepreneurs (No of patents)	%	Galician entrepreneurs (No of patents)	%	All (No of patents)	%
Certificate of Addition	94	4,7	14	4,8	108	4,7
Unknown	399	19,9	74	25,6	473	20,6
Patent of Introduction	364	18,2	44	15,2	408	17,8
Patent of Invention	1146	57,2	157	54,3	1303	56,8
<b>TOTAL</b>	<b>2003</b>	<b>100,0</b>	<b>289</b>	<b>100,0</b>	<b>2292</b>	<b>100,0</b>

Source: Spanish Patent Office.

It is important to notice that not all the patents were the same: there was great diversity in the value and industrial sectors of the inventions they protected; not all of them were granted nor put into practice; only a small proportion were in force for all the years they had right to; etc. These data are important to weight the value of each patent, but this is not the moment for such exercise. Nevertheless, just to give an idea about it, I have reflected in table 10 the distribution of patents according to their 'legal' type. The Spanish patent legislation basically established three types of patents: 'patents of invention', which protected own inventions with a legal monopoly of 20 years; 'patents of introduction', which protected foreign inventions not patented in Spain by their inventors with a legal monopoly of 5 years; and 'certificates of addition', which protected improvements of previously granted patents. As table 10 shows, the bulk of the applications were patents of invention, but there was a significant amount of patents of introduction, a peculiarity of the Spanish patent

system not found in other countries<sup>12</sup>, that facilitated the importation of foreign technology, an 'innovation' method very common among Spanish entrepreneurs.

Table 11. 100 Spanish and 46 Galician entrepreneurs ordered by number of non patented innovations.

No of non patented innovations	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
None	27	27,0	14	30,4	40	28,2
One	27	27,0	11	23,9	37	26,1
Two	18	18,0	4	8,7	21	14,8
Three	12	12,0	7	15,2	19	13,4
Four	9	9,0	5	10,9	14	9,9
Five	6	6,0	5	10,9	10	7,0
Six	1	1,0	-	-	1	0,7
TOTAL	100	100,0	46	100,0	142	100,0

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009).

Table 12. Types and number of non patented innovations developed by the 100 Spanish and 46 Galician entrepreneurs.

Type of innovation	Spanish entrepreneurs (No of innovations)	%	Galician entrepreneurs (No of innovations)	%	All (No of innovations)	%
Hiring of foreign technicians	4	2,4	1	1,2	5	2,0
Importation of machinery and technicians	3	1,8	10	11,8	13	5,3
Importation of machinery and/or process	38	22,4	31	36,5	68	27,5
Commercial innovation	23	13,5	6	7,1	29	11,7
Process innovation	17	10,0	6	7,1	21	8,5
Product innovation	21	12,4	9	10,6	28	11,3
Organizational innovation	20	11,8	6	7,1	25	10,1
Introduction of a new foreign product	27	15,9	14	16,5	40	16,2
Improvement of an existing product	17	10,0	2	2,4	18	7,3
TOTAL	170	100,0	85	100,0	247	100,0

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009).

However, as we have said, many innovations are not reflected in patent records, so if we take only patents into account our vision of the entrepreneurial innovative activity will be incomplete. To solve this problem we have collected the entrepreneurs' non patented innovations that figure in the biographical dictionaries<sup>13</sup>. Table 11 shows that almost 30 per cent of the entrepreneurs did not develop any innovation (outside the patent system), so more than 70 per cent did. But, what kinds of innovations are we talking about? We have classified them into nine types (table 12), including not only technological innovations but also commercial and organizational, as well as importation of techniques/technicians<sup>14</sup>. As table 12 shows, the most important way of innovation by the entrepreneurs was through importation of machinery/process (27.5 per cent of the innovations), followed by the introduction of new foreign products (16.2) and by commercial innovations (11.7). These data seem to confirm the idea that Spanish entrepreneurs were not characterized by their originality, but by their tendency to imitate successful foreign innovations. Many other comments to these data can be made, but they must wait for the future. Nevertheless, it is important to have at least an idea about the temporal distribution of the entrepreneurial non patented inventions. So, to finish this section, we have elaborated figure 3 with the basic information about it. The graph reflects what would

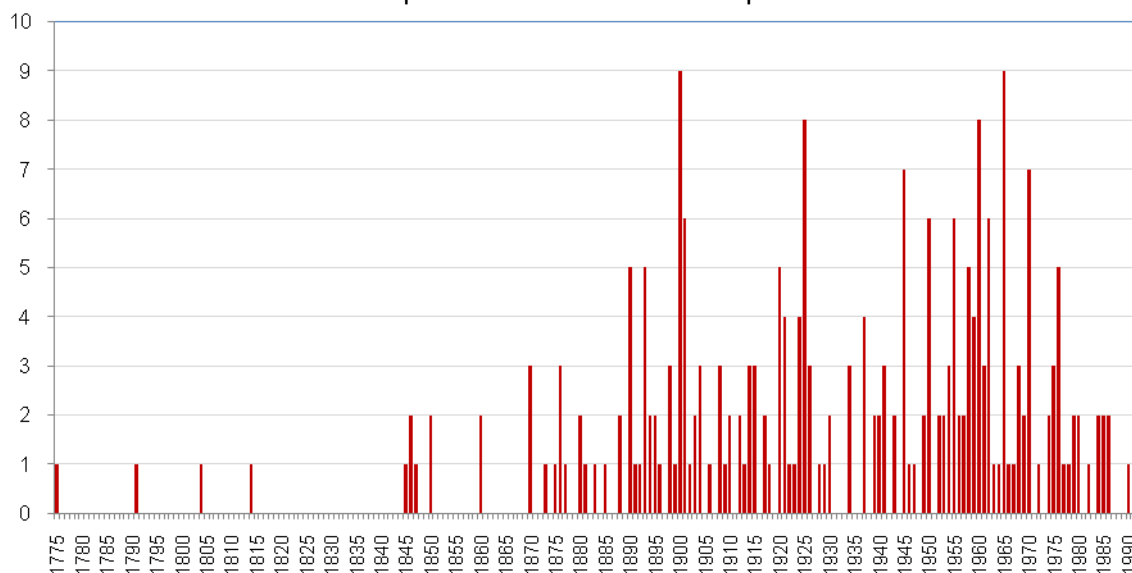
<sup>12</sup> See Saiz (2009).

<sup>13</sup> This source is in this aspect less reliable than patent records because the entrepreneurs' biographies are not very extensive, so it is probable that not all the non patented innovations appear in them.

<sup>14</sup> We have only considered these as innovations in the cases that the entrepreneur was the pioneer in introducing a foreign technique in Spain.

be expected: innovations were more abundant during the periods in which the Spanish economy was more dynamic; it is to say, during the transition from the 19<sup>th</sup> to the 20<sup>th</sup> century, the nineteen twenties, and the fifties/sixties.

Figure 3. Number of non patented innovations developed by the 20<sup>th</sup> century  
100 Spanish and 46 Galician entrepreneurs.



Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009)

## 2. Indicators of entrepreneurial success

We have just presented a brief description of some of the variables that can influence the entrepreneurs' success, but we have not defined so far what we understand by entrepreneurial success. This is the object of this section. It is not an easy task because entrepreneurial success is not a univocal concept and because it has different dimensions. Besides, not all these dimensions are easily measurable, especially for long term studies. So, what we have done in the first place is to define some measurable dimensions or indicators of entrepreneurial success that can be obtained out of the entrepreneurs' biographies we are using as sources for our study. These dimensions are the following: longevity of the entrepreneur's business enterprise; size achieved by it; technological complexity; internationalization (exports or not; multinational or not); and number of sectors in which the entrepreneur had a significant activity. Let us analyze these indicators one by one and show the overall level of the entrepreneurs of our samples in relation with them.

The first indicator of entrepreneurial success we have included in the database is the longevity of the business enterprise. We have defined it as the number of years since the beginning of the entrepreneur's business activity until his bankruptcy or until he or his family lost control of the company. As table 13 shows, the most common business longevity (for more than 60 per cent of the entrepreneurs of our samples) was between 50 and 99 years. But this information is biased, because it does not take into account that the earlier the entrepreneur begins his activity the longer can be his business longevity, so it undervalues more recent entrepreneurs who are still active. To correct this bias we have calculated the percentage of the years of longevity upon possible longevity (normalized longevity)<sup>15</sup>. Table 14 shows that almost 40 per cent of the entrepreneurs have achieved the maximum possible longevity, that is to say, their companies are still alive and in hands of their family. This means that in more than 60 per cent of the cases, the family has lost control over the company,

<sup>15</sup> It is to say, years since the beginning of the entrepreneur's activity up to the current year (2011).

which indicates that maintaining businesses under familiar control in the long run is a difficult challenge for entrepreneurs and a sign of success. Nevertheless, it is important to notice that only in 12.7 per cent of the cases the company has gone bankrupt, so that in 50 per cent of them the company is still operating, although in other hands (table 15).

Table 13. Longevity of the business enterprise of the 100 Spanish and 46 Galician entrepreneurs (years since the beginning of the entrepreneur's business activity until bankruptcy or loss of family control).

Longevity (years)	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
Between 150 and 165 years	1	1,0	4	8,7	5	3,5
Between 100 and 149 years	28	28,0	8	17,4	36	25,4
Between 50 and 99 years	62	62,0	30	65,2	88	62,0
Between 21 and 49 years	9	9,0	4	8,7	13	9,2
TOTAL	100	100,0	46	100,0	142	100,0

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009) and webs of the companies.

Table 14. Normalized\* longevity of 100 Spanish and 46 Galician entrepreneurs.

Percentage upon possible longevity	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
100%**	40	40,0	16	34,8	53	37,3
Between 75 and 99%	33	33,0	10	21,7	43	30,3
Between 50 and 74%	21	21,0	9	19,6	29	20,4
Between 25 and 49%	5	5,0	9	19,6	14	9,9
Between 16 and 24%	1	1,0	2	4,3	3	2,1
TOTAL	100	100,0	46	100,0	142	100,0

\* Percentage of the years of longevity upon possible longevity.

\*\* This means that the entrepreneur's family is in control of the company still in 2011.

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009) and webs of the companies.

Table 15. Continuity of the business enterprise of the 100 Spanish and 46 Galician entrepreneurs.

Situation of the company in 2011	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
In hands of entrepreneur's family	40	40,0	16	34,8	53	37,3
Continues in other hands	54	54,0	18	39,1	71	50,0
Gone bankrupt	6	6,0	12	26,1	18	12,7
TOTAL	100	100,0	46	100,0	142	100,0

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009) and webs of the companies.

But neither the second measure of longevity (percentage upon possible years) is neutral, as it tends to favor more recent entrepreneurs. A possible solution to this problem is to calculate an index of longevity including the two measures just explained, compensating in this way one bias with the other. We have calculated it assigning the same weighting (50%) to both measures and establishing the maximum value of the index in 1<sup>16</sup>. The overall results are reflected in table 16, which shows that the value of the index of longevity for around 70 per cent of the entrepreneurs was over 0.60. Anyway, an econometric model is needed to rightly assess the significance of this index and maybe to modify it.

<sup>16</sup> To construct the index, we have assigned the value 1 to the most long-lived business enterprise (165 years) and to the businesses still in hands of the entrepreneur's family in 2011 (100% of the possible longevity). For values under the maximum, both variables have been assigned the corresponding (under 1) proportional value.

Table 16. Index of longevity of the 100 Spanish and 46 Galician entrepreneurs.

Index of longevity (maximum = 1)	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
From 1 to 0,80	18	18,0	9	19,6	26	18,3
From 0,79 to 0,60	55	55,0	20	43,5	73	51,4
From 0,59 to 0,40	22	22,0	11	23,9	32	22,5
From 0,39 to 0,20	4	4,0	5	10,9	9	6,3
From 0,20 to 0,16	1	1,0	1	2,2	2	1,4
TOTAL	100	100,0	46	100,0	142	100,0

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009).

The second indicator of success we have taken into account is the size achieved by the entrepreneur's company/s. There are different ways to measure the size of a company –turnover, assets, capitalization, number of workers, etc.–, market capitalization probably being the most accurate. Our problems to obtain this figure are the limitation of our main source –the entrepreneurs' biographies– and the long temporal scope of the study. Once evaluated these problems, we have considered that the only comparable and available size indicator for all the entrepreneurs of our samples throughout the years is the number of workers. But this figure changes with time for each company, so the information we have collected is the maximum size achieved by the entrepreneur's business enterprise/s. Then, we have classified them into six categories from very small enterprises to companies of more than 5,000 workers. As table 17 shows, the difference in company size between the Galician entrepreneurs and the selection of 20<sup>th</sup> century Spanish entrepreneurs is very remarkable in favor of the latter, whose business enterprises achieved more than 1,000 workers in 90 per cent of the cases. As it happens with other data, this observation can be itself a confirmation that the size is a good indicator of entrepreneurial success, as the entrepreneurs included in the Spanish sample have been considered to be particularly successful. Anyway, we must wait to contrast this impression by the econometric analysis.

Table 17. Size achieved by the business enterprises of the 100 Spanish and 46 Galician entrepreneurs (Number of workers).

Size of the enterprise (No of workers)	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
1. Very small (1-19)	-	-	-	-	-	-
2. Small (20-99)	-	-	8	17,4	8	5,6
3. Medium (100-499)	1	1,0	16	34,8	17	12,0
4. Big (500-999)	10	10,0	9	19,6	19	13,4
5. Very big (1,000-4,999)	50	50,0	9	19,6	58	40,8
6. More than 5,000	39	39,0	4	8,7	40	28,2
TOTAL	100	100,0	46	100,0	142	100,0

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009) and webs of the companies.

The technological complexity of the business enterprise/s can be considered another dimension of entrepreneurial success. The explanation is obvious: it seems more meritorious to create a high-tech than a low-tech company. This is why we have classified our entrepreneurs according to the technological level of their companies. To do this, we have sorted the entrepreneurs' businesses by industrial sector and assigned to each sector –including services– a technological level according to some standard classifications<sup>17</sup>, but slightly adjusting it when qualitative information obtained in the biographies has made it advisable. Specifically, we have used a six-level scale from very low to very high technological complexity, as shown in table 18. Again, the difference between the Galician and

<sup>17</sup> Eurostat (2010), pp. 246-47.

the selection of Spanish entrepreneurs is significant, the former's activities being less technologically complex than the latter's. Nevertheless, the data show that the entrepreneurs as a whole were especially concentrated in medium-low and low technology sectors.

Table 18. Technological complexity of the business enterprises of the 100 Spanish and 46 Galician entrepreneurs.

Level of technological complexity	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
1. Very low	-	-	3	6,5	3	2,1
2. Low	21	21,0	20	43,5	40	28,2
3. Median-low	34	34,0	7	15,2	41	28,9
4. Median-high	26	26,0	10	21,7	35	24,6
5. High	12	12,0	4	8,7	15	10,6
6. Very high	7	7,0	2	4,3	8	5,6
TOTAL	100	100,0	46	100,0	142	100,0

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009).

In relation with the internationalization of the business enterprise –another recognized sign of entrepreneurial success–, we have included two different dimensions in the database: exportation (or not) to foreign markets, and establishment (or not) of branches of the company in other countries. The data about the first dimension (table 19) show that more than 60 per cent of the entrepreneurs' companies exported goods or services to other countries. In this case, as an exception, the Galician entrepreneurs were slightly superior to the selection of Spanish entrepreneurs. The geographical situation of this region (at the North-West of Spain), near Portugal and with several large active ports, could be one of the factors explaining the higher propensity of her entrepreneurs to look for foreign markets, but this question needs deeper study. On the contrary, in the other dimension (multinational establishment), the selection of 20<sup>th</sup> century Spanish entrepreneurs was clearly superior to the Galician ones (table 20), as 45 per cent of them –versus 22 per cent– have become multinational companies. So, considering both dimensions altogether, it is clear that the former was the most successful group of entrepreneurs according with their international presence.

Table 19. Exportation activity of the business enterprises of the 100 Spanish and 46 Galician entrepreneurs.

Export activity?	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
No	37	37,0	16	34,8	53	37,3
Yes	63	63,0	30	65,2	89	62,7
TOTAL	100	100,0	46	100,0	142	100,0

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009) and webs of the companies.

Table 20. Multinational establishment of the business enterprises of the 20<sup>th</sup> century 100 Spanish and 46 Galician entrepreneurs.

Multinational?	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
No	55	55,0	36	78,3	89	62,7
Yes	45	45,0	10	21,7	53	37,3
TOTAL	100	100,0	46	100,0	142	100,0

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009) and webs of the companies.

But the analysis of the scope of the geographical establishment of the companies can be more accurate if we distinguish between countries, continents and, even, regional/national presence within Spain. The variety of cases in relation with this is wide, so we have classified them in seven categories

from less to more geographically extended activity of the business enterprises. Table 21 shows that the activity of the Galician entrepreneurs was mainly local (71 per cent of them were established in only one region) and that the 20<sup>th</sup> century Spanish selected entrepreneurs not only had a significant foreign presence, but a much more extended presence in Spain, as 32 per cent of them had productive centers in all the Spanish geography or at least in various regions.

Table 21. Geographical establishment scope of the business enterprises of the 100 Spanish and 46 Galician entrepreneurs.

Place of business enterprise's establishment	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
1. One Spanish region	23	23,0	28	60,9	49	34,5
2. Some Spanish regions	13	13,0	3	6,5	16	11,3
3. Latin American country*	-	-	7	15,2	7	4,9
4. Spain as a whole	19	19,0	-	-	19	13,4
5. Spain and Latin America*	23	23,0	6	13,0	28	19,7
6. Spain and developed Europe**	13	13,0	1	2,2	14	9,9
7. Spain and various continents	9	9,0	1	2,2	9	6,3
TOTAL	100	100,0	46	100,0	142	100,0

\* Or Southern European or African country. \*\* Or North American or Asian country.

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009) and webs of the companies.

The last indicator of entrepreneurial success we have analyzed is the number of sectors in which the entrepreneurs were significantly involved. This has been considered a sign of success with the argument that it shows the versatility or ability of the entrepreneur to be involved in various economic sectors and/or to adapt to changeable market conditions<sup>18</sup>. But this is not so clear, because it could be the case that an entrepreneur changes from one sector to another because he has failed in the first one. So the number of sectors is an ambiguous indicator of success. Anyway, it is interesting to contrast this hypothesis and to study this information, so we have included it in the database. The results (table 22) seem to confirm at first sight the ambiguity of this variable as an indicator of entrepreneurial success, as there is no significant difference between the Galician and the 20<sup>th</sup> century Spanish selected entrepreneurs. Nevertheless, we must wait for the results of the econometric analysis to formulate a reliable conclusion.

Table 22. Number of sectors of activity of the 100 Spanish and 46 Galician entrepreneurs.

No of sectors	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
One	14	14,0	7	15,2	21	14,8
Two	32	32,0	15	32,6	46	32,4
Three	18	18,0	9	19,6	27	19,0
Four	11	11,0	3	6,5	14	9,9
Five	9	9,0	6	13,0	15	10,6
Six or more	16	16,0	6	13,0	19	13,4
TOTAL	100	100,0	46	100,0	142	100,0

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009) and webs of the companies.

Once presented the indicators of entrepreneurial success included in our study, an obvious idea arises: successful entrepreneurs may have excelled in some indicators but not in others, so if we try to measure the level of entrepreneurial success with only one indicator, the conclusion may be wrong or at least biased or incomplete. That is, we need to take into account the indicators just

<sup>18</sup> See Tortella *et al.* (2011).

explained (or others) altogether –or at least some of them– to obtain a comprehensive measure of the entrepreneurial success that at the same time can be useful to compare the performance of entrepreneurs with very different characteristics and business strategies. According with this idea, we have calculated a synthetic index of entrepreneurial success using the explained indicators. The main difficulty to do it is to know what weight to assign to each component. There are techniques of multivariate analysis oriented to solve this kind of problems, but while we conclude such study we have decided –as a provisional solution– to assign the same weight to each one of the six indicators, it is to say, one sixth (1/6). Although it is a rough measure that will need to be adjusted or modified, it can be useful as a first approach to our objective. The estimation of the index for the entrepreneurs of our samples (table 23) shows at least two interesting results. First, the percentage of very successful entrepreneurs (index value over 0.8) is notoriously higher among the 20<sup>th</sup> century selection (18 per cent) compared with the Galician entrepreneurs (4.3 per cent), what confirms the idea that entrepreneurs included in the former sample were particularly successful. Second, there are not entrepreneurs in any of the samples with an index value under 0.20, what indicates that all of them achieved a minimum significant level of success.

Table 23. Synthetic index of entrepreneurial success of the 20<sup>th</sup> century 100 Spanish and 46 Galician entrepreneurs.

Synthetic index of entrepreneurial success (maximum = 1)	Spanish entrepreneurs	%	Galician entrepreneurs	%	All	%
From 1 to 0,80	18	18,0	2	4,3	19	13,4
From 0,79 to 0,60	39	39,0	14	30,4	50	35,2
From 0,59 to 0,40	30	30,0	18	39,1	48	33,8
From 0,39 to 0,20	13	13,0	12	26,1	25	17,6
From 0,20 to 0,00	-	-	-	-	-	-
TOTAL	100	100,0	46	100,0	142	100,0

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009) and webs of the companies.

### 3. Provisional test of the hypothesis

The final object of our study is to know until what point the factors described in the first section have determined entrepreneurial success. Although some favorable signs have appeared and been commented in the previous pages, to obtain a satisfactory answer to such question a deeper analysis and a rigorous quantitative study are needed. As we have just said, that study –using techniques of multivariate analysis– is in process at this moment. But, while it is finished, we have made a rough quantitative exercise to get some provisional impressions. The exercise has consisted of calculating the average value of the different entrepreneurial success indicators of the entrepreneurs of our samples, ordered by groups according with the determinant factors' level. What we try to check is whether our hypothesis that the latter positively influence the former is plausible or not. Obviously, the hypothesis is considered to be verified if the success indicator's average value is higher the higher the determinant factors' level.

The results of the test are summarized in table 23, where the entrepreneurial success indicators –including the synthetic index– have been situated in the superior row and the seven determinant factors in the left column. We have marked in grey color the cells with data not matching the basic hypothesis, so a quick look at the table can help the reader to obtain a first general impression of the degree of relationship between the different variables. If we take into account the predominance of the white versus the grey cells, the impression is that there seems to be a positive overall relation between the dependent and the independent variables included in the study, with the only exception of the geographical origin factor. But other more specific provisional evidences can be deduced from the data.

Table 23. Relation between entrepreneurial success and its determinants in the 142 20<sup>th</sup> century Spanish selected and Galician entrepreneurs (Average value of the success indicators of the entrepreneurs, ordered by groups according with the determinant factors' level).

Ordered groups of entrepreneurs	Entrepreneurial success indicators	Synthetic index of entrepreneurial success (max. = 1)	Index of longevity (max. = 1)	Size of the company (1 = Very small; 6 = Very big)	No of sectors	Technological complexity (1 = Very low; 6 = Very high)	Multinational (1 = Yes; 0 = No)	Export activity (1 = Yes; 0 = No)
1) According with the number of patents								
With 10 or more patents		0,65	0,67	5,20	3,51	4,04	0,39	0,71
With patents		0,62	0,66	4,98	3,24	3,66	0,38	0,69
Without patents		0,52	0,64	4,24	2,78	2,57	0,37	0,50
Average		0,59	0,66	4,74	3,09	3,30	0,37	0,63
2) According with the number of non patented innovations								
With 4 or more innovations		0,62	0,71	4,76	2,64	3,64	0,52	0,68
With innovations		0,60	0,66	4,85	2,73	3,32	0,44	0,67
Without innovations		0,55	0,64	4,45	4,03	3,25	0,20	0,53
Average		0,59	0,66	4,74	3,09	3,30	0,37	0,63
3) According with the number of years of family business tradition								
50 or more years of tradition		0,58	0,67	4,54	2,86	3,37	0,34	0,69
With family tradition		0,60	0,67	4,70	3,22	3,29	0,37	0,66
Self-made entrepreneurs		0,57	0,63	4,81	2,83	3,33	0,38	0,56
Average		0,59	0,66	4,74	3,09	3,30	0,37	0,63
4) According with the level of studies								
College studies		0,63	0,65	5,15	3,20	3,68	0,47	0,65
Secondary studies		0,48	0,67	3,00	3,67	2,67	0,17	0,50
Apprenticeship		0,52	0,64	4,37	2,95	2,79	0,26	0,53
Without studies/Unknown		0,55	0,68	4,44	2,88	2,98	0,28	0,65
Average		0,59	0,66	4,74	3,09	3,30	0,37	0,63
5) According with the age of beginning of the entrepreneurial activity								
24 years of age or less		0,59	0,68	4,58	3,29	3,29	0,32	0,68
25-30 years of age		0,59	0,64	4,67	2,83	3,33	0,43	0,69
31-39 years of age		0,58	0,68	5,26	3,30	3,30	0,39	0,43
40 years or more (until 56)		0,49	0,49	5,00	2,67	3,17	0,33	0,33
Average		0,59	0,66	4,74	3,09	3,30	0,37	0,63
6) According with the year of beginning of the entrepreneurial activity								
From 1770 to 1849		0,44	0,65	2,83	2,83	3,17	0,00	0,50
From 1850 to 1899		0,54	0,68	4,18	3,31	3,24	0,16	0,61
From 1900 to 1939		0,60	0,64	5,11	2,95	3,24	0,44	0,60
From 1940 to 1976		0,70	0,64	5,50	3,05	3,68	0,77	0,77
Average		0,59	0,66	4,74	3,09	3,30	0,37	0,63
7) According with the geographical origin of the entrepreneur/family								
1. Southern regions		0,60	0,64	4,71	2,29	4,00	0,57	0,57
2. Northwestern regions		0,56	0,64	4,31	3,13	3,02	0,31	0,65
3. Aragón, Navarra, La Rioja		0,55	0,64	4,00	4,00	2,83	0,33	0,50
4. Valencian C., Balearic Islands		0,60	0,65	5,11	3,11	2,78	0,33	0,78
5. Madrid		0,52	0,60	5,43	2,57	2,86	0,43	0,29
6. Basque Country		0,69	0,67	5,48	4,24	4,10	0,48	0,71
7. Catalonia		0,59	0,68	4,86	2,50	3,54	0,39	0,64
8. Europe (UK, France)		0,55	0,74	4,75	2,58	3,08	0,33	0,50
Average		0,59	0,66	4,74	3,09	3,30	0,37	0,63

Sources: Torres (dir.) (2000) and Carmona Badía (coord.) (2006 and 2009), webs of the companies, and Spanish Patent Office.

There are two especially remarkable evidences. The first one is –as we have just pointed out– that the geographical origin of the entrepreneurs (and/or their families) seems to have no correlation – or very weak– with their level of entrepreneurial success, as we find the highest success indicators' values both in the less economically developed regions (1 to 4) and in the most developed (5 to 8). Nevertheless, the longevity index is an exception to this rule, as it is clearly correlated with the

geographical origin. Besides, if we consider the indicators altogether, the Basque Country (6) seems to have been the most “productive” region of successful entrepreneurs in Spain. The second clear evidence is that the only determinant factor that matches the hypothesis for all the entrepreneurial success indicators is the number of patents. As patents are a measure of the technological effort of the entrepreneurs, this could be indicating that technological innovation is the most determinant variable for entrepreneurial success.

Although not so clear as the number of patents, there are other three determinant factors that match the hypothesis to a great extent. The first one is the year in which the entrepreneurs began their entrepreneurial activity. This is a temporal variable and our hypothesis is that the earlier the entrepreneurs began to be so the higher possibility of success. The idea behind this hypothesis is that the socio-economic progress of Spain throughout 19<sup>th</sup> and 20<sup>th</sup> centuries has created an increasingly favorable environment for business enterprises, thereby improving the probability of entrepreneurial success. Table 23 shows that this has come true in almost all the cases, so time –better, economic and institutional changes throughout time– seems to have positively influenced entrepreneurial success. The second determinant is the age at which the entrepreneurs properly began their entrepreneurial activities. As we have supposed, the results shown in table 23 indicate –with very few exceptions– that the younger the entrepreneurs began, the higher their level of success; so the age seems to be another significant explanatory variable. The third factor is the number of non patented innovations. Like the two previous ones, this determinant seems to match our hypothesis in most of the cases, confirming the idea that innovation may be important for entrepreneurial success.

Finally, table 23 shows two factors with an ambiguous or not clear relation with the entrepreneurial success indicators. The first one is the number of years of family business tradition, which only seems to clearly influence in a positive way two success indicators: the longevity and the exportation activity of the company. This result is somehow positive as we can deduce from it that entrepreneurial success does not depend too much on the antecessors’ achievements, being enhanced the importance of the entrepreneur’s initiative: the self-made entrepreneur may have ‘great expectations’. The second ambiguous factor is the entrepreneur’s educational level. No doubt it is quite clear that the entrepreneurs with college studies were –with few exceptions– the most successful ones, confirming in this way our hypothesis; on the other hand, it is very striking that the entrepreneurs without studies achieved higher levels of success than those with median studies or apprenticeship and, in two cases, the same level than those with college studies. So it seems that education has not been a decisive determinant of the Spanish entrepreneurs’ success.

In relation with the entrepreneurial success indicators, the most remarkable evidence shown in table 23 is –if we exclude the geographical origin determinant– that the variable exportations is the one that better matches our hypothesis (with only one exception), followed by the synthetic index of entrepreneurial success (two exceptions) and by the level of technological complexity (three exceptions). The other four indicators do not match up so well with the hypothesis, but it is clear that in all of them the favorable cases are much more abundant than the exceptions. So we can conclude that all the entrepreneurial success indicators are positively influenced by the considered determinant factors, although not by all in the same degree and with the clear exception of the geographical origin. Another conclusion is that the synthetic index of entrepreneurial success seems to be a good summary of the six indicators it includes. Nevertheless, this and all the evidences presented in this section must be considered as provisional rough impressions at least until the results of the multivariate analysis we are carrying out are at our disposal.

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