NATURE OR NURTURE? FACTORS OF ENTREPRENEURSHIP: A COMPARATIVE APPROACH

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Summary

There is an ongoing discussion about whether entrepreneurship is basically an innate gift or whether education has a traceable effect on the quality and success of entrepreneurs. This paper tries to put these hypotheses to test by means of a comparison of English and Spanish businessmen. Based on a large database, and using descriptive analysis and econometric tests it shows that although the educational systems in both countries are quite different, entrepreneurs respond to the quantity and quality of education they have received.

Introduction

The role of the entrepreneur in economic development is well established since Schumpeter published his *Theory of Economic Development* almost a century ago (1911) and perhaps since Von Thünen wrote his *Isolated estate* in 1826. One could even go back to Cantillon (1755) and Adam Smith (1776). Cantillon's definition of the entrepreneur is of remarkable modernity as we will see later on. Entrepreneurial studies are proliferating lately and a question which is cropping up often is: what moves entrepreneurs? Of course we know that the profit motive is the chief drive but the present question is a little more refined: what makes a successful entrepreneur? Or, in other words: is it just a matter of genes, or drive, or calling, or are there more general factors (social, psychological) which move people to become entrepreneurs; and not only this: what makes entrepreneurs successful? We will argue (as Cantillon does, by the way) that almost everybody has played the role of entrepreneur at some moment or other. The question is, why are some successful and others no? What makes some behave in a certain way and others differently?

About these and somewhat related topics there has recently been debate among Spanish economic historians. One of us wrote years ago about "the weakness of the Spanish

entrepreneurial spirit" [Tortella (2000), p. 207]. Other writers have debated this statement. García Sanz [(1996), pp. 111-113], for instance, criticized it while apparently not in total disagreement. Other authors seemed to agree at least in a general way. Carreras and Tafunell, for instance, have written that "there has never been in Spain a <managerial revolution>" [Carreras and Tafunell (1999), p. 301]. Many others could be cited.

The historical reasons for this weakness of the entrepreneurial spirit in Spain (there is agreement that the situation has improved recently) are worth studying by themselves and also to better understand Spanish economic history and that of other developing countries. We do not think that Spaniards are different in ability or industriousness from at least neighboring peoples, but there may be geographical or historical reasons which may explain some differential traits. While Spain cannot boast inventor-entrepreneurs of the stature of Marconi, Edison, Watt, Bessemer, Siemens, Chardonnet, etc., there are a few remarkable individuals in Spanish history of similar inventor-entrepreneurial nature, such as Narciso Monturiol and Isaac Peral (both invented submarines in the nineteenth century), Juan de la Cierva (invented the *autogiro*, a forerunner of the helicopter), Damià Mateu (launched the Hispano-Suiza automobile early in the twentieth century with a motor designed by Mark Birkigt, a Swiss engineer living in Barcelona, early in the twentieth century), Alejandro Goicoechea (invented the Talgo train), and Leonardo Torres Quevedo, who devised calculating machines and chess-playing robots, and the still functioning *Niagara aerocar* in the late nineteenth century. Almost a constant in the history of these individuals (save perhaps Goicoechea) was incomprehension and lack of response on the part of Spanish society. One detects here more a social than a genetic problem.

Carreras and Tafunell have tried to explain the reasons for the rarity of big business and other peculiarities of Spanish enterprise. They adduce three main explanations: first, small market size; second, lack of comparative advantages in sectors where big business thrives; and, third, lack of a "real entrepreneurial culture" and the lateness with which business schools appeared [Carreras and Tafunell (1996), p. 90 and (1999), pp. 302 and 299]. Let us say in a few words that the first explanation is unconvincing. If narrowness of the domestic market were an explanation for the absence of big business, how could we explain the existence of big multinationals in Switzerland, Sweden, or the Netherlands? The second explanation is not very convincing either: why should oranges and fruits, minerals, or olive oil, all products in which Spain has a natural advantage, not be conducive to big business? There are multinationals in food products, in drinks and spirits, in cork, in minerals, and in other products which Spain exports or

has exported. The only plausible and intriguing explanation is the third one. Social factors, among them the educational system, are worth studying further. For unknown reasons, Carreras and Tafunell reject that education should have something to do with the weakness of the entrepreneurial spirit in Spain. Thus, in a recent synthesis they edited on Spanish entrepreneurial history [Carreras, Tafunell and Torres Villanueva (2003), p. 334 (our translation)], they state that:

> Educational retardation cannot be considered as an obstacle to the appearance of entrepreneurs, since it is conceivable that tradition and on-the-job learning could be adequate channels for attaining the knowledge needed to carry out entrepreneurial initiatives.

One is surprised by the total lack of evidence offered to support so radical an assertion. We hope to be able to show in the following pages that education has indeed an influence on entrepreneurial callings and on the ways they developed.

There is no doubt that the topic is complex. There is a continuous feedback between economic growth at large and the entrepreneurial spirit. As we hinted before, entrepreneurship has developed in twentieth-century Spain. Tortella himself has written: "It cannot be doubted that the entrepreneurial spirit has not been lacking in twentieth-century Spain" [In Torres Villanueva (2000), p. 15]. Even so, another specialist in the topic has written [Guillén (2005), p. 8]:

> Spain has become a fully developed country from the theory's point of view, while lagging seriously behind other major countries in terms of technological and marketing expertise.

The behavior of Spanish present-day multinationals is not exactly what one would expect according to the country's level of development. Adds Guillén [*Ibid*., p. 227]:

> Spain is the only "advanced" country that spends more on lotteries than on R&D. In fact, lottery expenditure [...] stands at nearly twice R&D expenditure [...] While in the OECD as a whole businesses contribute two-thirds of total R&D expenditure, in Spain they only contribute about half. The reasons why Spanish firms do not spend enough on R&D are not well understood.

In spite of all the progress, Spanish businessmen still mistrust the profitability of investing in science and technology. And if this is the present situation, when the country's

economy is among the largest in the world, one may imagine what the situation was before, and ask to what extent this type of attitudes may have played a role in the slowness of Spain's development and whether it is possible that they may still be an obstacle in the future. This is why a look at the education of entrepreneurs from a long-run standpoint and from a comparative perspective may yield some results.

It should be added that this discussion is not limited to Spain. In many other countries the issue of the economic role of education and of its role in the formation of the entrepreneurial spirit is going on and perhaps nowhere as much as in England. Among the most notable are the writings of Aldcroft, Coleman, Fox, Jeremy, and Sanderson [See, for instance, Aldcroft (1990), Coleman (1973) and the articles collected in Tortella (1990) and Núñez and Tortella (1993)]. It is interesting that while in England, the cradle of the Industrial Revolution and still one of the economic leaders in the world, scholars debate bitterly about "Education and Britain's Growth Failure" as one of Aldcroft's articles is entitled, the problem should be declared non-existent by leading Spanish scholars.

This is not an exclusively Spanish problem, however. There is an established scholarly tradition which sustains, on very shaky evidence, that education has little to do with economic growth. American scholars such as David Mitch and Harvey Graff belong to this school and in Italy Renato Giannetti, in an authoritative survey [Giannetti (1997)] also holds this outlook. We are not going to go into this complex discussion here, and refer to a book edited fifteen years ago [Núñez and Tortella (1993)]. Let us go back from this excursus into the actual research we have been carrying out.

Method and Sources

Our main source are Biographical Dictionaries, whose number, fortunately, is increasing everyday. So far we have processed the data of 288 Spanish and 1,712 British businessmen culled from the books by Torres Villanueva (2000), Vidal Olivares (2005) and Cabana (2006) for Spain and Jeremy (1984-1986) and Jeremy (1994) (which we will call JI and JII for short) for Britain.

For Spain were have therefore three volumes. Those of Vidal Olivares and Cabana are regional and deal with Valencian and Catalan businessmen respectively, while Torres Villanueva studies one hundred Spanish businessmen whose activity took place in the twentieth century. Vidal Olivares' and Cabana's volumes also include nineteenth-century biographies and all three

of them are supposed to deal with the most distinguished individuals in their respective regions and periods. The Spanish subsets, therefore, are rather distinct. The "Spanish" group is limited to the twentieth century but, being a subset from a wider population than those of the regional dictionaries, it offers a richer variety of sectors of activity, whereas Catalan and Valencian biographies are more concentrated upon consumer industries: food and textiles. (We are now processing data from Carmona (2006) and material from other unpublished volumes kindly made available by *Editorial LID*).

The *Dictionary* of David Jeremy (JI) offers some 1,200 biographies of British businessmen grouped into five volumes. Its time span is 1860-1980; this is the period when the entrepreneurs were active; some were born even before 1800. The selection criterion is territorial: these were businessmen operating in England and Wales; Scotland and Ireland are therefore excluded. This does not mean, however, that there are no individuals from these areas; there are, provided they worked mostly in England and Wales; the same goes for foreigners such as Americans (U.S. and Canada) and Germans of which there is a fair number. The same authors' (with Geoffrey Tweedale) *Dictionary of Twentieth Century Business Leaders* (London 1994), what we will call JII, offers 750 biographies of twentieth-century British business leaders, of which 209 are included in JI.

We have so far extracted a sample of 1,712 biographies from the Jeremy books (JI and JII) and 288 from the Spanish books (not 300 because there is some overlapping). In the British sample we have made a distinction between those businessmen who acted rather as managers than pure entrepreneurs (i.e., as salaried employees rather than risk-takers). In the Spanish case we have sometimes separated the one-hundred (101, actually) elite twentieth-century entrepreneurs from the regional businessmen because there are reasons to assume that these are two distinct subsets. We have also selected two elite groups (i.e., those we consider as the most distinguished and accomplished) among British businessmen, 100 for the nineteenth-century (1830-1918) and 102 for the twentieth (1919-1980). The criteria utilized in the selection of the English elite samples have been social prominence, economic achievement, technical achievement, and versatility. A list of our English elite samples is available in the Appendix A. We must say that although about 10 percent of the cases were borderline, the bulk of individuals seemed quite obvious and straightforward cases.

Our samples show certain limitations of which we are conscious. The first and fundamental problem is that devising an unbiased sample of entrepreneurs is impossible. We are

dealing in both cases with a distinguished group of entrepreneurs-businessmen whose careers and successes were doubtless above average. One difficulty in this connection lies in that the border between entrepreneurs and non-entrepreneurs is wide and blurred. First, the distinction that we have made between managers and entrepreneurs is not watertight (although undeniable). Second, even the definition of entrepreneur is imprecise. Many scholars consider that what defines an entrepreneur is the willingness to take risks and the ability to adapt to (and take advantage of) unexpected situations. Yet this can also be said about surgeons, boat skippers, airplane pilots, policemen, truck drivers, even orchestra conductors. Furthermore, a vast majority of people have undertaken entrepreneurial activities at some point in their lives, have engaged in some kind of business: just making decisions about one's estate is an entrepreneurial activity: buying or selling a house, contracting a mortgage, borrowing or lending, all these are entrepreneurial activities which most adults (and some teenagers) assume with greater or lesser frequency. We are interested in full-time entrepreneurs, but even these are difficult to tell apart from part-time entrepreneurs, and frequently in our samples we find individuals who became entrepreneurs gradually, and, in some cases, intermittently. We must, therefore, not only define the entrepreneur as a risk-taker and somebody able to take advantage of and adapt to unexpected situations, but also somebody who obtains profit by combining factors of production within the framework of a market. Purely professional activities, however profitable, are not entrepreneurial. This is why we think that a pure manager is not a real entrepreneur, but rather a professional. Let me say *en passant* that these notions are not new. Richard Cantillon characterized the entrepreneur as the person whose customers paid extra to avoid the risk and the bother of storing the merchandise they were going to consume in the future; thus the income of entrepreneurs was uncertain (*gages incertains*), and this is why they were so often bankrupt [Cantillon (1952; orig. edn. 1755), pp. 22-31]. Thirdly, what makes an entrepreneur well known is success. You do not find entrepreneurial biographies of failed businessmen (unless they have been involved in titillating scandals); most often failed businessmen abandon business. So the fact of being studied already presupposes a measure of success, of being above average. Simple continuity in business already implies success.

In consequence of all this, we do not worry too much about sample bias. We think that "average entrepreneur" is an elusive concept and, after all, we are not trying to understand the average entrepreneur, but rather what makes a successful entrepreneur, since we believe that entrepreneurial success is conducive to social welfare. As the econometrician in our team said, if

we want to know what makes horses run we should study thoroughbreds.

For these reasons we have frequently made comparisons between our 101 twentieth-century Spanish entrepreneurs and the two similar groups of elite English entrepreneurs referred to before.

The variables we have selected for the following exercises are: first, studies: secondary, vocational, apprenticeships, college-level and university studies; within college and university studies we have taken into account field of study (law, medicine, engineering, etc.); we have also tried to take into account not only quantity (years studied) but also quality (for instance, in England public schools are supposed to be superior to grammar schools at the secondary level and we have considered them separately); second, family relations: whether there is a business saga, business-related marriage, to what extent family background has determined the business activity of our entrepreneurs, etc.; third, we have studied the versatility or adaptability of the entrepreneur, measured by the number of fields (such as banking, textiles, food, electricity, etc.) in which the agent operated; finally, we have taken into account other activities not strictly entrepreneurial, such as teaching or research, politics, religion, philanthropy, professional associationism, prizes, titles of nobility, patronage, etc.

For us the main explanatory variable is education, although not the only one. Family related variables may also be used as explanatory, and some social indicators, such as religion, country or region of origin, may be so used also, although our problem with religion now is that this variable does not apply in the Spanish case. The dependent variables are those that refer to entrepreneurial performance: versatility (sector and number of sectors), plus other non strictly professional, such as political and other social activities. These variables should reflect the contribution of entrepreneurs to social welfare. Since the ability to adapt, according to Casson [Cassis and Minoglou (2005), pp. 28 and 54]) is one of the key attributes of entrepreneurs, versatility is one of our key indicators of quality of the entrepreneurial factor, as adaptation often will entail transferring factors from one sector to another. In a second stage of our analysis we have qualified or weighted versatility in two ways. First, technological depth: some sectors are more technologically "sophisticated" than others: e.g., chemicals and electricity have greater "technological depth" than food or textiles. Second, some sectors have shown a stronger demand than others in recent years: computers or some services, for instance, have seen their demand increase at a faster pace than clothing, say, or furniture. Therefore we have weighted sectors so as to take these nuances into account on the assumption that entrepreneurs working in sectors

that are technologically deeper and in higher demand make a better contribution to overall economic growth and welfare. Finally, we have also considered that belonging to our elite samples is an indication of entrepreneurial success and have considered it as a dependent variable in some of our econometric exercises.

Preliminary Results

Tables C.1.1, C.1.2 and C.1.3 show that the elite groups in both countries had rather dissimilar levels in their studies: in all, the Spaniards had a higher level of college-level studies than the English, but also a higher proportion of entrepreneurs with low levels of study. For university studies, Spaniards could boast more than half elite entrepreneurs while the proportion was lower in the English samples. Spanish businessmen, therefore, tended to be considerably more polarized in terms of their education. There were few of them with secondary education who did not go on to the university.

In raw terms English entrepreneurs have been commonly depicted as having relatively low levels of formal education until quite recently. This was already pointed out in a pioneering study by De Miguel and Linz [(1964)] who compared a Spanish sample with samples of English, US, and French businessmen. They found that Spanish and French entrepreneurs had higher standards of formal education than their Anglo-Saxon counterparts. The same has been observed more recently by Cassis [(1999), pp. 132-142] in a comparison of French, British, and German businessmen. The French had the highest levels, then the German, and the British came last. However, Cassis concludes that the differences in educational levels between British, French, and German business elites had little effect on business or economic performance. He argues that the differences among educational systems were less that usually thought.

De Miguel and Linz did not conjecture about the possible meaning of these discrepancies of levels, although they pointed out that "the English educational system makes comparison difficult [...] What is the Spanish equivalent of the <Public Schools>, so exclusive and traditional, or of elite universities?" It is true that a mechanical comparison between Spanish and English educational levels omits very important qualitative aspects. England has a greater tradition of less formal learning (tutorials, independent primary schools, apprenticeships). And it is true that there are no equivalents in Spain to Public Schools (very select secondary schools, such as Eton, Harrow, Rugby, and others whose prestige is often higher than that of universities). Within universities, the distinction of some is far superior to that of others (Oxford and Cambridge, for instance) to extremes that are unknown in Spain. We have taken these questions

into account and have added two categories, "apprenticeship" and "public school", among other explanatory variables. There are no public schools in Spain, and apprenticeships are less frequent than in England.

In the following pages we will carry out two types of analysis. To start with, we will develop a descriptive survey making use of our elite samples and also our more extended ones, i.e., the Catalan and Valencian set plus the two wide English samples. And to finish we offer some econometric exercises which refine and, in our opinion, reinforce the conclusions from the descriptive survey.

A)*Descriptive analysis*

Tables C.1.1,C.1.2, and C.1.3, reflect the educational levels of entrepreneurs. If we add those without studies and those about whose studies we have no information in percentages we find that 34 percent of Spaniards probably had no studies above primary school (since the most probable is that "don't know" means "no studies") compared to 22 percent of Englishmen in the JI sample and 15 percent of twentieth-century English businessmen (JIII). However, the picture changes if we take **university-level studies** (Rows 7 to 13) into account. If we include "Unfinished university studies" (Row 13), over half (52.1 percent) of Spanish entrepreneurs had attended institutions of higher education whereas only 30.6 percent of English (JI) had. Even the JIII sample of twentieth-century Englishmen exhibits a lower proportion of university trainees (48.1) than the Spanish sample. If we excluded those who had not finished their university studies, the proportions would not vary appreciably: 49.7 for Spain, and 26.9 for JI and 45.9 for JIII. This is one of the big differences between Spanish (more generally, continental) and British entrepreneurs: whereas Spaniards went to the university, Englishmen had more practical modes of training in mind. It is possible that this may be due to the character deliberately humanistic and anti-utilitarian of English universities, especially the top ones, until well into the twentieth century, as contrasted with French and German universities, more inclined to experimental sciences and to being in contact with industry. John Stuart Mill, no less, in an Inaugural as Rector of St Andrews University in 1867 said the following:

> There is a tolerably general agreement about what a university is not. It is not a place of professional education. Universities are not intended to teach the knowledge required to fit men for some special mode of gaining a livelihood. Their object is not to make skilful lawyers and physicians or engineers, but capable and cultivated human

beings.

Mill admitted that there was a social demand for engineers and "industrial arts", but he thought these matters should be taught elsewhere, not at universities [Cited in Sanderson (1972), p. 5]. Continental universities did not emphasize this distinction: the Polytechnic institutes (Spanish *"Escuelas especiales,"* French *"Écoles Polytechniques,"* German *Hochschulen*, American Institutes of Technology -MIT, Caltech) were considered part of the universities, although somewhat autonomous, or akin to universities. This reticence on the part of English universities to embrace technological institutes until relatively recently has been acerbically criticized by British specialists (Sanderson, Aldcroft, Coleman).

In exchange, the proportion of English businessmen having gone through **apprenticeship** was 28.2 percent in the JI sample, more than double the Spanish case, 12.2. The proportion was also higher in the JII sample: 17.9 percent. Furthermore, many English apprenticeships were "articled", i.e., they carried practical studies in factories or firms and ended up in the acquisition of a title or degree, very frequently in engineering, but often also in accounting, law or actuarial science. In fact, those articled apprenticeships were not very different from the studies in polytechnic schools in the continent.

The other English specialty was the **Public Schools**, already mentioned above. These elite institutions of secondary education are considered by some as almost closer to universities than to ordinary secondary ("grammar") schools. In many cases they have been considered as entrance doors to the best universities. In other cases their prestige was considered sufficient by their alumni to substitute for a college education, especially by those vowed to business and politics. Some 4.7 percent of English businessmen in our JI sample and 6.0 percent in JII studied in Public Schools and did not go on to college. Among elite businessmen the proportion was 4.0 percent in the nineteenth century and 5.9 percent in the twentieth.

Regional disparities among Spanish businessmen were considerable; unfortunately the only regional biographies we have processed so far relate to Catalonia and Valencia. The differences among these two groups and with the Spanish elite group are considerable. The Valencia group had a distinctly lower level of university studies: only 39.5 percent, whereas the total Spanish average was 52.1. The Catalans were slightly above the average (55.2) and the Spanish elite group clearly above: 64.4, i.e., almost two in three elite businessmen had university studies. What is remarkable about Spanish businessmen is how low was the proportion of those

who had secondary studies but did not go on to college or university: about 2 percent. There are at least two reasons for this: 1) Almost no vocational study programs were (and are) available; and 2) access to university studies has always been easy and cheap for Spain's middle classes.

As to the **degree of self-sufficiency** of businessmen, we have established four categories: self-made, heirs, nearly-self made, and nearly-heirs. On one extreme are those entrepreneurs who created a successful firm or product by themselves or almost: we call them **Self** (or **S**) for short; on the other extreme are those who inherited an ongoing concern from close relatives; in most cases these entrepreneurs made the firm larger or more profitable, or branched out into other sectors, etc.; but they started out with a clear advantage: we call them **Heirs** (**H**); then we have two intermediate gradations: nearly self-made, those who had some help from relatives but created something different and fairly new (**NS**, nearly self); and those who received substantial family help but introduced considerable quantitative o qualitative changes (**NH**, nearly heirs). We have not had too much trouble classifying our subjects. As Tables C.2.1,C. 2.2, and C.2.3 show, Spanish entrepreneurs relied more on family networks than English: for the large samples, 49 percent of Spanish entrepreneurs were self-made, and 57 percent of the English in the JI sample and 65 percent in the JII (all in all, 60 percent of English entrepreneurs were self-made).

In the elite groups (Cols. 3 and 4 in Table C.2.1 and 7-10 in Table C.2.2) the English proportion was also slightly higher; 51 (53 percent for nineteenth-century entrepreneurs, 50 percent for twentieth-century)against 48 percent for Spaniards. What is remarkable, but not surprising, is that among English managers (not entrepreneurs proper) the self-made were 78 percent. These were people who owed their success to their skills; their level of studies was clearly higher than the average; as we said, these people were a mixture of entrepreneur *cum* professional. As to Spanish regional variations in the proportions of self-sufficiency, they are not remarkable. Valencians are slightly above average. Catalans more clearly below. One reason why this should be so is that Catalan industrialization preceded Valencian by almost a century, so that most Catalan entrepreneurs in the sample are already second generation, whereas many Valencians are beginners.

Conversely, the proportion of heirs is larger among Spaniards than among English: 31 percent versus 26 percent in the JI sample and 24 percent in the JII. This would seem natural, since Latin societies tend to have stronger family ties. The picture gets more blurred, however, if we focus upon elite groups: Spanish elite entrepreneurs received substantially less help from their families (heirs were less than one fourth, 23,8 percent), whereas elite English entrepreneurs

received about the same proportion of family help as in the larger sample: elite heirs were 29 percent in the nineteenth century, 25 percent in the twentieth (26 percent in the larger sample). If we aggregate "heir" and "nearly heir" it turns out that, while in the large samples the proportion of heirs and near heirs was higher in the Spanish case (40.6) than in the English (37.5), the reverse is true for the elite samples: of the elite twentieth-century Spanish group only 35.6 percent received substantial family help, whereas the proportions were 41.0 percent for the English nineteenth-century sample, 42.2 for the twentieth-century one.

Turning to the **economic sectors** into which our agents worked, Table C.3.1 offers an interesting comparison. It shows the percentage of entrepreneurs from each national sample who worked in the different sectors. The structures are quite different. To start with, Spanish entrepreneurs were more concentrated in a few sectors, while the British were more evenly distributed. Then, the large Spanish sample (Col.1) shows a rather traditional sectoral distribution: Banking, Agriculture, Textiles, Building and Real Estate, Chemistry, and Commerce are the main sectors where Spanish businessmen worked; by contrast, British entrepreneurs were concentrated in Transportation, Metallurgy and Machinery, Commerce, Automobile and Aeronautics, Banking, Textiles, and Communication and Show Business. Aside from Banking and Commerce, which hardly denote modernity or tradition, the main sectors for Britain (Transportation, Metallurgy and Machinery, and Automobile and Aeronautics) are typical of an industrial economy, while of the main Spanish sectors only Textiles and Chemistry are genuinely industrial, with Textiles typical of the early industrial stages. Spanish industrialists seem to be highly specialized in Textiles, although there are a couple of surprises: Chemistry concentrated a higher proportion of Spanish than of British entrepreneurs, while there is more concentration in Mining in Britain than in Spain. The truth is that Chemicals have traditionally been a strong industry in Spain (and let us not forget that we are dealing with percentages, not absolute numbers). As to Mining, although the mineral richness of Spanish soils is (was) proverbial, two facts explain the largest concentration of British entrepreneurs: first the basis of British metallurgy was iron and coal mining; and second, many large Spanish mining companies were the property of Britons. Aside from these occasional exceptions, it is obvious that the occupational structure of entrepreneurs reflected the higher technical makeup of the British economy. Even the relatively larger size of British Communication and Show Business reflects the greater weight of the press and the publishing sector in Britain.

Comparing the elite groups (Cols. 2, 4, and 5) the conclusions are similar, although with

some interesting nuances. Spanish elite businessmen are even more concentrated than those of the larger sample, and that mainly in three sectors: Banking goes up from 14.2 to 18.4 percent; Food stays around 14 percent; and Building stays around 10.5 percent. The Textile sector, by contrast, goes down considerably, from 11.3 to 4.5. Commerce goes down considerably also, from 6.1 to 2.3, and, though in lesser proportions, so do Consumer Industries and Communication and Show Business. In exchange, other sectors become more crowded: Mining does so in a most clear way, attracting 5.0 of elite entrepreneurs, contrasted with 1.9 in the larger sample. The same happens in Iron and Steel (from 2.9 to 5.0), Chemistry (from 7.1 to 8.4), Power and Electrical Equipment, which combined go from 5.2 to 6.7), and Insurance (from 1.5 to 3.4). On the whole these changes confirm a well-known fact: Spanish big businessmen in the twentieth century inclined towards banking and heavy industry in a much greater degree than those on the lower echelons, who preferred consumer industries.

English elite businessmen exhibit a more nuanced and complex picture. Here again, as in the larger sample, they show less sectoral concentration; the Table, furthermore, seems to exhibit a trend towards de-industrialization, something which is not present in Spanish elite entrepreneurs at all. English elite entrepreneurs in the twentieth century seem to veer towards the tertiary sector. Their most popular sector is Communication and Show Business, which goes from 7.0 percent in the nineteenth-century elite sample to 10.8 percent in the twentieth-century elite group; second comes Automobile and Aeronautics (from 3.5 to 10.5), a very large increase but largely due to the fact that these industries are typical of the twentieth century and almost unknown in the nineteenth. Another expanding sector is Food and Agriculture while the concentration in such traditional sectors as Metallurgy and Machine Building, Iron and Steel, and Textiles goes down. In exchange, Consumer industries go up. This sector includes home appliances and furniture, office machines and scientific and photographic instruments. Chemistry was the only heavy industry sector where elite businessmen were more concentrated in the twentieth than in the nineteenth century. Other sectors whose attraction for English elite entrepreneurs went up in the twentieth century are Insurance, Services (law, accounting, and tourism are the largest sub-sectors), and Transportation. The relative fall in Commerce obviously does not mean that the sectoral output went down, but probably that English retailing was not as innovative and dynamic in the twentieth century as it had been in the nineteenth.

Comparison of the Spanish elite sample with the British elite samples of the nineteenth and twentieth centuries also yields interesting results. The Spanish concentration in Banking is

remarkable. We have already commented on that: it must be pointed out that the elite sample shows even more concentration in that sector than the larger sample. Compared to the English twentieth-century elite, the Spanish elite almost triples the degree of concentration in Banking. The second largest sector for the Spanish elite was Agriculture and Food Processing; it was a considerable sector in Britain too, and growing (compare with Col. 5). In both countries this sector must have a traditional element (weightier in Spain, no doubt) and another element related to retailing and modern food processing, and the trend must be the growth of the second at the expense of the first. Another sector which is disproportionally larger in the Spanish sample is Building and Real Estate. This must be related to the fact that Spanish population grew in the twentieth century at a faster rate than in the nineteenth and also experienced a marked improvement in its standard of living. The Spanish twentieth-century business elite was much more concentrated in heavy industry than the wider sample: such is the case of Power, Chemistry, Mining, and Iron and Steel. By contrast, British elite entrepreneurs tended to abandon the traditional heavy industry sectors: such is the case with Iron and Steel, Metallurgy and Machine Building, and Mining. Another traditionally very strong industry, British textiles, also declined from the nineteenth to the twentieth century. The trend towards a tertiary-sector economy in Britain is visible in the growth of Services (although small), Insurance, Transportation and, above all, Communication and Show Business (mostly publishing and cinema). The comparison of the elite samples, therefore, again shows the weight of traditional industries in Spain and the tertiarization of the British economy in the twentieth century. If we disaggregated further than the tables show, we would see that there was a larger proportion of twentieth-century British elite businessmen in Tourism (included in Services) than Spanish.

The contrast between the elite samples is therefore rather eloquent. In twentieth-century Spain big business gravitated towards banking and heavy industry; in England it veered towards the tertiary sector and deserted heavy industry. The obvious explanation for this is the different degree of maturity of both economies. England was becoming post-industrial while Spain was industrializing.

The tables of the 4th group reflect the correspondence between **areas of study**, with especial attention to university, and sectors of activity. Tables C.4.1.a, C.4.2.a, C.4.3.a, and C.4.4.a show the polarization in the studies of Spanish entrepreneurs: 33.7 percent had no secondary or university studies (or we have no information); at the other end, 52.1 percent had university studies. Only 14.2 percent had gone to secondary school or taken apprenticeship but

had no university studies. This was in contrast with British entrepreneurs, where there was a large "middle stratum". Between the 22.2 of English entrepreneurs with "No studies" beyond primary school or "Unknown" and the 30.6 percent who went to college or university, there was almost half (47.2 percent) who had secondary studies or had taken an apprenticeship.

The same polarization obtains for the Spanish elite sample (Tables C.4.2.), only here the weight of university studies is more considerable (64.3 percent), and that of lower education smaller (23.8) while the intermediate stratum is a paltry 11.9 percent. In contrast both English elite samples show a substantial proportion of businessmen with secondary education and no university or college studies (43.1 percent for the twentieth century sample, 57.0 for the nineteenth century one)

In the wider Spanish sample, the second largest group was that of "No studies," and those businessmen tended towards the traditional sectors: Food, Textiles, Building and Real Estate, and Commerce, in addition to Banking. As to those who had been apprenticed and therefore had not gone to the university but had had professional training, they again flocked towards the less technically sophisticated sectors: Textiles, Commerce, and Food, in addition to Banking, which was a sort of "joker card" sector. Commerce, is also somewhat of a portmanteau, in that it may span from high-level international trade cum finance activities to just plain peddling. Those with university studies are even more concentrated in Banking, Agriculture and Food, and Real Estate, but their presence in Chemicals, Communication and Show Business, Textiles, Transportation, and Iron and Steel is (with the exception of Textiles) much stronger than that of the other groups. The textile sector is more the preserve of those with lower levels of education. Examining fields of study in more detail (Table C.4.1.b), we see that the engineers are more concentrated in more technical sectors such as Power and Electrical Equipment, Chemistry, and Metallurgy and Machine Building, although also in Building and Real Estate (not too surprising, since the group includes Road and Bridge Engineers, and Architects) and in Banking and Agriculture and Food. The other large group of Spanish entrepreneurs with university studies is that of lawyers and economists. This is a versatile group: bankers predominate, but Agriculture and Food is a strong second, followed by Building and Real estate, with Textiles, Transportation, and Services somewhat behind. Obviously, social science students tended to be jacks-of-all-trades. The other groups were rather small, so just a brief comment should suffice: it seems logical that those with degrees in Sciences should concentrate in Chemicals.

Let us now look at the lowest rows. The fourth row from bottom gives us the total of

sectors and the third the total of individuals; the second row shows the quotient or ratio, i.e., the average number of sectors per businessman or, in other words, a simple indicator of versatility according to the area of study. In the last column we have the totals: last column, second row from bottom tells us that the average versatility of Spanish businessmen was 1.8 sectors per person. Engineers were above average, although in the lawyers and economists' case, slightly below, the difference was probably not significant. Somewhat surprisingly, the other groups that are clearly above the average are those with other, not specified, university degrees (another portmanteau) and those who did not finish their studies, although these not much above average. All in all, however, these figures support our initial assumption: university studies (see Table C.4.1.a, Col. 5) make entrepreneurs more versatile, and also better able to tackle sectors that are more complex technically. This does not seem very surprising to us, but not much evidence of this sort has been gathered before. And, as we saw in the introduction, these results should surprise some scholars.

Turning to Table C.4.3.a, we see the data relating to the wider English sample. English entrepreneurs seem to have been less versatile than the Spanish, for an average of 1.3 sectors for each individual. Those lacking university or secondary studies are concentrated upon Commerce, Transportation, and Textiles, very traditional sectors in England. As in the Spanish case, their versatility is below average. In general, the versatility of English businessmen is clustered around the average, with a few exceptions: those who did not finish their university studies were clearly less versatile than the average, those who graduated from Public School and those who studied sciences were clearly more versatile; those who studied economics and commerce were also about one percentage point above average. Public School students clustered around four sectors: Banking, Commerce, Transportation, and Metallurgy. There is no clear pattern here, save their versatility and their strong specialization in Banking (29 percent). Those who took an apprenticeship, articled or not, veered heavily towards Metallurgy and Machine Building, with Automobile and Aeronautics as a strong second, and Transportation in third place. No surprise here. Other sectors that those who had been apprenticed tended to were Building and Real Estate, Textiles, Power and Electrical Equipment, and Commerce. The pattern here is a clear preference for the technical and mechanical industries. For those who graduated from college or university without a distinct specialization no clear pattern is discernible either: Transportation, Textiles, Mining, Banking are the main sectors, but there is a wide spread.

Turning to our elite samples, Tables C.4.2.A and C.4.2.B depict Spanish entrepreneurs

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and C.4.4.a, C.4.4.b and C.4.5.a and C.4.5.b describe English entrepreneurs. Some contrasts are telling: for instance, almost one quarter of our elite Spanish entrepreneurs had studied law, while of the 202 English elite entrepreneurs only 3 did, a paltry 1.5 percent. In exchange, 30 percent of elite English entrepreneurs had taken up apprenticeship, as contrasted with 10 percent of the Spanish. Another clear contrast is the proportion of elite entrepreneurs who took up secondary studies only: 14.9 percent of the English. If we add those who attended Public Schools, the combined percentage is 19.8 percent. By stark contrast, the proportion of Spanish elite entrepreneurs who did secondary studies only is 2 percent. We commented on this before.

As expected, most of the elite Spaniards with no university training (including the ones we have no information about) gravitated towards more traditional sectors: Food, Building, Textiles, and Banking. By contrast engineers, while also prominent in Banking and Building, were almost equally conspicuous in Power and Electrical Equipment, Metallurgy, and Chemicals. It is interesting that engineers should be relatively numerous in Communication and Show Business. There is three of them in this sector, as many as in mining. This is due to a curious coincidence: one of the three in Communication and Show Business (Pau Salvat i Espasa) was the scion of a saga of book publishers who studied architecture (he designed the firm's building) but in the end followed the family tradition; another (Nicolás Urgoiti) was an engineer who started out working for a paper mill and became a newspaper publisher. Lawyers, on the other hand, flocked to Banking (over one half of them) and Insurance. A little more surprising is that four of them should be in Iron and Steel.

Elite English entrepreneurs were more evenly distributed. Banking was less prominent than among Spaniards and technical sectors more so. Those with no university or secondary education (or "no information") were 17 percent of the total. They gravitated towards Commerce and to Communication and Show Business, but also towards Iron and Steel. A good example is William M. Aitken, Lord Beaverbrook, of Canadian origin, a self-made man with no university studies (he failed a Latin exam) who became a press tycoon in England. There are no comparable press magnates in Spain, although in our sample Urgoiti, Godó (a textile and newspaper saga) and Luca de Tena were the founders of relevant newspapers, two of them still extant. In large part the importance of this sector (Communication and Show Business) was due to the prominence not only of the press, but also of the theater and cinema in English society. Other sectors which attracted non-educated English elite entrepreneurs were general Services, and Textiles. Of the one third (66 individuals) of English elite entrepreneurs who undertook

university studies one sixth (24 percent) never finished. By contrast, 101 (50 percent) had secondary studies, apprenticeship, or went to Public Schools. Of these, 65 took up technical professions, in sectors such as Metallurgy and Machine Building, Automobile and Aeronautics, Power and Electrical Equipment, Transportation, Chemistry, and Iron and Steel. Of the total elite group this was about one third (32.2 percent) . This contrasts with 13 (6 percent) among those with lower levels of education who undertook work in those sectors. The proportion of those who took occupation in those technical sectors among the college or university educated was 23.3 percent (47 individuals). From this standpoint, in the English elite, entrepreneurs with secondary education seem to be the most technologically inclined, and those with higher studies a little less, while those with no or only elementary education seem to belong to a different population with much lower technical propensities or abilities. The same seems to obtain in Banking, Commerce and Tourism. Banking seems to have attracted the educated much more, whereas Commerce and Tourism seem clearly the domain of the less educated.

To what extent did university education make a difference in England? Not much when compared with secondary education. The university- educated seem to have been more specialized in Automobile and Aeronautics, Banking, Iron and Steel and Chemistry than the other groups and clearly less in Food. In Automobile and Aeronautics and in Banking the more education the more participation seems to have been the rule. But, to repeat, among English elite entrepreneurs the great divide seems to have been between those with only primary education (or less) and the others.

Among the Spanish elite the cleavage is between the university-educated and the rest, because there was no middle ground.

To reiterate once more, these impressionistic but stubbornly consistent conclusions seem quite commonsensical and self-evident but, as we have seen, are far from being widely shared. Elite entrepreneurs both in England and in Spain had higher levels of education that the average. In addition versatility and the choice of more technically sophisticated sectors also seem to be a function of the level of studies and of the fields of study. The main difference between the two countries was that secondary education was much more effective in England that in Spain, so many successful entrepreneurs in England just completed this level of education.

One possible objection which could be posed to our finding that successful entrepreneurs have a higher educational standard than the average (or than those less prominent or successful) is that the relation may be just the inverse, i.e., the causation might not run from studies to

performance, but rather in the other direction; or, al least, that there might be a reciprocal causation. The possibility exists that those entrepreneurs who have higher-level studies may often belong to prosperous families and, therefore, they may owe both their success and their high-level studies to a third factor: family income or status.

In order to contrast this alternative hypothesis we have analyzed our "Self" sample to see whether the level of studies was significantly different from the rest. Since the self-made entrepreneurs do not owe their success to their families' wealth, in this case the role of family income as independent or causal variable should be excluded. Even if their higher-level studies were due to their family income, their entrepreneurial success would not be; education would remain the main independent variable. Therefore, if family income or status were determinant, the level of studies of the "Not-self-made" should be significantly lower.

Tables C.5.1 and C.5.2. show the relative level of university studies of Spanish and English entrepreneurs by groups and percentages. "All" refers to the wider sample, "Elite" to the elite samples. In the first row, first column, 32.6 means that 32.6 percent of all Spanish self-made entrepreneurs in the wider sample had only primary studies or we do not know. The corresponding figure for English entrepreneurs is 24.7 percent. And so on. The Spanish figures in the even rows are in general higher because we know their levels of study were more polarized. Either they had only primary-level studies or less, or they went to the university. If the elite self-made Spaniards had a low figure for "No studies" this was because they had a very high proportion of university degrees. The clear exception in the English case was that of the "Managers" (we have no similar category for Spain), whose educational level was much higher for reasons we discussed before. All in all it does not seem that self-made entrepreneurs had a significantly higher educational level than the others, either in England or in Spain. On the contrary, in the wider sample both in England and in Spain self-made entrepreneurs were below in educational level, but the differences were small: 5.1 percentage points in England, 0.6 in Spain.

In the Spanish elite sample the situation was reversed by wider margin: 12.3 percentage points. This means that it was among the more successful entrepreneurs that education made some difference: those self-made were the better educated and this could be interpreted as meaning that family income played some role. Nevertheless, as we will see, Chi-square tests show the difference not to be significant.

In the English elite samples the results are contradictory: in the nineteenth century elite

group the self-made had lower university levels; the reverse is true for the twentieth-century elite.

In order to gain some precision we ran some Chi-square tests and they show that in the Spanish case the differences in levels of studies and also in fields of study between "Self-made" and the others were not significant at the 1 percent level, both for university studies and for the other group, i.e., those with primary and secondary education. The results for the English sample, with the same degree of significance, were similar, with one exception. Among those who had no university education, the "Self-made" had followed apprenticeship studies in a relevant number, while the in other group those who attended public schools made a considerable subset. This was the only significant difference between "Self-made" and the others, and this only for England.

B) *Econometric analysis*

B.**1) The Logit Models**

We start with the analysis of a variable that would express a degree of entrepreneurial success. According to the definitions of entrepreneurship which we cited before, economic versatility (or adaptability) could be considered as one of the essential qualities of entrepreneurship. We assume that the more versatile an entrepreneur is, the more successful, or, at least, the better prepared he is to be successful.

After a series of failed trials with linear regression, we decided to try the **logit** method, since most of our variables are of the discrete nature to which logit is best adapted.

Our dependent variable, therefore, will be the **number of sectors** in which our subjects had been active. It has been made discrete by considering that the entrepreneur was **versatile** if he operated in more that one sector, and not versatile if he operated in only one sector.

Our independent variables are:

Birth = Year of birth; this is the only continuous (non discrete) variable.
Appr = Apprenticeship
ArtAppr= Articled Apprenticeship
EconLaw= Economics and/or Law
SciArch= Sciences and/or Architecture
VarUnf= Various fields or unfinished university studies
Public = Public School
Sec= Secondary school
NoUnk = Only primary studies, no studies or unknown (option of reference)
S = Self-made
NS= Nearly Self-made
NH= Nearly Heir

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H = Inherited an ongoing business (option of reference).

All these variables have been more fully discussed above. The only not discussed is year of birth. We have included this variable because we wanted to know whether as time passed entrepreneurs became more or less versatile. There are reasons in favor of one and the other possibility. They could become more versatile as their years and the quality of schooling lengthened and improved. They could become less so as economic complexity increased and specialization became more necessary for a good performance. An example will suffice: we found that in England carpenters or cabinetmakers often ended up designing airplanes, as did automobile engineers. The somewhat surprising role of carpenters in the early years of aviation was due to the fact that the first fuselages were made of wood. As materials and design improved, however, only aeronautical engineers designed airplanes. In this case, the correlation would be negative.

Our model then would be as follows:

Prob (Y=1) = Prob (versatile entrepr = 1) =

$$= \frac{\exp(\beta_0+\beta_1 Nac+\beta_2 Ingl+\beta_3 ApprMed+\beta_4 Publ+ \ldots +\beta_7 Heir+\beta_8 Self)}{1+\exp(\beta_0+\beta_1 Nac+\beta_2 Ingl+\beta_3 ApprMed+\beta_4 Publ+ \ldots +\beta_7 Heir+\beta_8 Self)}$$

Where "exp" is the exponential number (i.e., "e")

Our initial sample is a set of 1181 English entrepreneurs; from the original 1712 from which we have eliminated those who could be categorized as "managers".

And the results would be as summarized in Table 1:

Table 1

Parameter	Estimate	Standard Errors	t-ratios
Constan	t-1.5988710	4.7388093	-0.33739930
Birth	3.5047717e-005	0.0025604750	0.013687975
Appr	-0.27342438	0.22587257	-1.2105249
ArtAppr	-0.28107408	0.24878060	-1.1298071
EconLaw *	0.57453743	0.32603793	1.7621797
SciArch	0.37520838	0.25064518	1.4969702

VarUnf	0.13321616	0.24940815	0.53412913
Public ***	0.96588428	0.30720860	3.1440665
Sec	-0.010434710	0.24656959	-0.042319534
(NoUnk)	option of reference		
NS ***	1.2502198	0.29493717	4.2389360
NH ***	0.65088357	0.23935620	2.7193095
S	0.27027580	0.17915978	1.5085741
(H)	option of reference		

Levels of significance: * 10%; ** 5%; *** 1% (applicable throughout the paper)

MEASURES OF FIT:

Likelihood Ratio Chi-square: 41.8713
   with 11 d.f., prob=0.000
-2 Log Likelihood for full model: 1261.0690
-2 Log likelihood for restricted model: 1302.9403
Percent Correctly Predicted: 76.7993

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The most significant educational variables are **Public** (significant at 1% level) and **EconLaw** (at 10%). They tell us that the most versatile entrepreneurs were those who had attended public school and, with a smaller probability, those who had studied economics or law. Further tests will show that the **Public** variable is quite robust (so much so that we can only subscribe Berghoff's conclusion, that "the hypothesis of the negative influence of public schools on late nineteenth- century economic growth must be rejected *in toto*": Berghoff (1990), p. 166), while **EconLaw** is considerably less so. As to what we have called entrepreneurial self sufficiency, our results show that moderately self-sufficient entrepreneurs (**NS** and **NH**) were more versatile than self-made or heirs. These results are quite logical. By our definition heirs tended to stick to the business and the sector they inherited; self-made probably also stuck to the business they built and therefore tended to stay in that same sector.

Although not significant, it is interesting to note that three variables have negative values: **Appr**, **ArtAppr**, and **Sec**. We interpret this as a strong indication that college- or university-level studies contributed to entrepreneurial versatility, something that is suggested by the positive sign of **SciArch** and **VarUnf**, in addition to **EconLaw**. This will be confirmed in further tests. The apprenticeship variables, however, have positive signs and become significant in other, more refined tests as we will see. The **Birth** variable appears to be minuscule and not significant, but this will also change somewhat in further tests.

oOo

A first refinement of our analysis will be to introduce **multinomial logit** in order to be able to distinguish between "moderately versatile" (active in 2 sectors) and "highly versatile" (active in 3 or more sectors) entrepreneurs. The results are as follows (Table 2):

Table 2

Parameter	Estimate	Standard Errors	t-ratios
Option "2 sectors" vs "1 sector"			
Const	-2.8545013	5.2154941	-0.54731178
Birth	0.00060670174	0.0028176255	0.21532377
Appr	-0.11874345	0.24109394	-0.49251941
ArtAppr	-0.38215011	0.28554292	-1.3383281
EconLaw*	0.64065550	0.34907739	1.8352821
SciArch	0.20592752	0.28699962	0.71751844
VarUnf	0.17571579	0.27091305	0.64860588
Public***	0.89770483	0.33602778	2.6715197
Sec	0.0039628607	0.27119691	0.014612484
NoUnk : reference			
NS ***	1.0759166	0.32504409	3.3100636
NH **	0.59871671	0.25940679	2.3080225
S	0.19135534	0.19492196	0.98170230
H : reference			

option "3 or more sectors" vs "1 sector"

Parameter	Estimate	Standard Errors	t-ratios
Const	0.22770436	8.9080080	0.025561760
Birth	-0.0018858109	0.0048161196	-0.39156231
Appr*	-1.0749997	0.56650082	-1.8976137
ArtAppr	-0.0094928665	0.43133385	-0.022008165
EconLaw	0.28970883	0.66288880	0.43703985
SciArch**	0.81821008	0.41545561	1.9694284
VarUnf	-0.040910759	0.50346451	-0.081258476
Public**	1.1912513	0.51250057	2.3243902
media	-0.060878961	0.47095211	-0.12926784
NoUnk : reference			
NS***	1.8157885	0.49406380	3.6752106
NH*	0.86631934	0.47475095	1.8247869
S	0.57822555	0.37019224	1.5619602
H : reference			

MEASURES OF FIT:
-2 Log Likelihood for full model: 1555.9754
-2 Log likelihood for restricted model: 1608.4739
Percent Correctly Predicted: 76.1219

Here again in both cases **Public** has high values and significance: public school graduates were among the moderately and the highly versatile. The relative novelty is that while economics or law graduates were moderately versatile, scientists and architects emerge now as highly

versatile with a strong coefficient and good significance (5 %). For the rest, the comments about the straight logit model seem valid here.

As a final consideration, the predictive value of our model seems more than acceptable with better than three quarters of the cases correctly predicted in both simple and multinomial models.

oOo

A remark that we received when we read earlier versions of this paper in other forums was about the meaning of versatility as measured by number of sectors of activity. This might even indicate failure rather than success, we were told, since it could be that a businessman failing in a sector would move to a different one in hopes of better luck. This could be a sort of "forward escape" phenomenon (what the French call *fuite en avant*). We know this to be a rather infrequent case among the individuals in our sample, but we could only agree that just "number of sectors" seems too crude a measure, especially if not complemented with a different type of measure or variable. We then decided to make use of our elite groups or sub-samples. We already had a ready made elite sample of Spanish entrepreneurs in the Torres Villanueva book of the one hundred entrepreneurs of the twentieth century. We gathered two similar samples of around one hundred English businessmen, one of the nineteenth and another of the twentieth century (see p. 5 above). This would facilitate comparison; although the Spanish group belonged to the twentieth century only, since the English economy was far more advanced, comparison with nineteenth-century Englishmen seemed to us perfectly legitimate and justified.

The building of these samples not only permits comparison; it also provides us with a second variable indicating entrepreneurial success and very amenable to the logit model. Inclusion in our elite samples would be an alternative variable indicating success.

Our next test would, therefore, use **inclusion in our two English elite samples** (a total of 202 individuals) as dependent variable; the large sample would be that of 1181 entrepreneurs. The independent variables would be the usual ones. The results turned out as follows (Table 3):

Table 3

Parameter	Estimate	Standard Errors	t-ratios
Const***	82.747151	9.4011006	8.8018578

```
Birth***  -0.046419344    0.0051456287    -9.0211219
Appr **    0.66438734     0.31639091       2.0998939
ArtAppr    0.25369633     0.40187655       0.63127925
EconLaw   -0.60990338     1.0623570       -0.57410396
SciArch** 1.0955430       0.45210343       2.4232132
VarUnf *   0.79620120     0.42208246       1.8863641
Public **  1.1963696      0.53040476       2.2555785
Sec        0.56778958     0.40009453       1.4191386
NoUnk : reference
NS         0.25919766     0.51202455       0.50622115
NH         0.13679747     0.37648887       0.36335064
 S         0.089347366    0.27853741       0.32077330
 H : reference
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MEASURES OF FIT:
Likelihood Ratio Chi-square: 119.8564
  with 11 d.f., prob=0.000
-2 Log Likelihood for full model: 565.2159
-2 Log likelihood for restricted model: 685.0723
Percent Correctly Predicted: 91.6173

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Although again our educational variables seem to have considerable importance upon the success of English entrepreneurs, there are some notable changes in this new regression. For one thing, the fit is much better than in the "versatility" tests: almost 92 percent of the predictions are correct. For another thing, **Birth** turns out to be highly significant now, although it also has a negative sign and a low coefficient. This would seem to indicate that English entrepreneurs were a little less successful in more recent times, something that we find difficult to interpret. ¿May this mean that the age of the grandest English entrepreneurs was the heroic nineteenth century? Perhaps the main novelties, however, are the solid coefficient and high significance of **Appr** and the negative sign and lack of significance of **EconLaw**. These are novel but not too surprising. Apprenticeship has a strong tradition in England and a crucial role in the formation of entrepreneurs, who may not be very versatile, but often became highly successful in their fields of specialization. As to graduates in economics and law, their case seems to be the reverse: versatile, but not as well-rounded in their role of businessmen. **Public** again has a strong and highly significant coefficient and the same is the case of scientists and architects. Another group of university- and college-educated businessmen, including those who did not obtain a degree (**VarUnf**), has a respectable positive coefficient which is significant at the 10 % level. By contrast, the various degrees of self-sufficiency seem to have no appreciable effect upon entrepreneurial success. All in all, this model seems to confirm quite categorically that university and college training is a powerful lever to entrepreneurial success according to the two definitions of it we have used: versatility and overall distinction.

oOo

Our next step in the utilization of our elite samples will be to compare English and Spanish entrepreneurs. We return to our versatility model: dependent variable is again number of sectors per businessman and the independent variables are the usual except for four variations: one, **Public** has been eliminated because, as we know, public schools do not exist in Spain; two, for the same reason VarUnf has also been eliminated: Spanish universities have traditionally been very rigid and not permitted multidisciplinary degrees; three, articled and non-articled apprenticeships have been aggregated because there are no articled apprenticeships in Spain. The aggregate variable now is called **ApprT**. As result of these changes our English sample is reduced to 189 individuals (those who did not attend public school or went on to college); the Spanish sample is composed on 101 individuals; total sample size, therefore, is 290. The fourth variation is that we have added the variable **Engl** which denotes whether the entrepreneur was English or Spanish.

It is worth mentioning that since here we are dealing with elite entrepreneurs the "forward escape" phenomenon which could affect versatility as a positive entrepreneurial trait could be totally discarded.

The results are as follows (Table 4):

Table 4

Parameter	Estimate	Standard Errors	t-ratios
Const	5.1982335	8.5192048	0.61017825
Engl	-0.29682249	0.31930839	-0.92957937
Birth	-0.0032788158	0.0045265879	-0.72434600
ApprT **	-0.77288163	0.36311170	-2.1284955
EconLaw	0.62676281	0.40258646	1.5568403
SciArch *	0.72456247	0.37739344	1.9199127
Sec	0.39608676	0.45555058	0.86946822
NoUnk: reference			
NS ***	1.6287862	0.48842168	3.3347951
NH **	1.0409395	0.43195624	2.4098262
S *	0.59493965	0.32187621	1.8483492
H: reference			

MEASURES OF FIT:

Likelihood Ratio Chi-square:	32.5662
with 9 d.f., prob=0.000	
-2 Log Likelihood for full model:	358.5771
-2 Log likelihood for restricted model:	391.1433
Percent Correctly Predicted:	66.2069

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Our first finding is that the **Engl** variable is neither high nor significant, which undoubtedly means that the differences between English and Spanish entrepreneurs regarding versatility are not very important. Its sign is negative, though, which accords with our finding through descriptive analysis that English entrepreneurs were less versatile than Spanish. **Birth** is even lower and less significant, and also negative. The **Appr** coefficient is high and significant at the 5 % level. It is also negative. This agrees with our earlier findings that businessmen who went through apprenticeship tended to stick to their specialty and were not very versatile, although this did not prevent them from achieving distinction. **SciArch** has a positive sign and is significant at the 10 % level. **EconLaw**, although lower and non significant, has a positive sign. It compares well with **Sec**, confirming our impression that college education favors versatility. As to the degrees of entrepreneurial self sufficiency, it seems again that heirs were the least versatile, followed by self-made. This is also consistent with our previous findings.

The model, however, has lost predictive power relative to our earlier "versatility models" (Tables 1 and 2), no doubt due to diminished homogeneity when mixing English and Spanish businessmen.

B.2) Censored-variable (Tobit) Models

We have tried to introduce a further refinement in our analysis by giving weights to our sectors according to technological content and strength of demand criteria. Our weights have been obtained from Spanish sources [Segura (1989)] which make use of data from Eurostat, OECD, and other official agencies; the weights are available in Appendix B, Table B.3. Our aim is obvious: we consider that by operating in sectors with a higher degree of technological sophistication and of higher demand businessmen make a more positive contribution to economic development than by staying in sectors that are less innovative technologically or whose demand grows less.

Of course our variables are censored because our weights cannot be zero and therefore our weighted variables can never reach values below a certain positive minimum.

Our first run refers to the "**technological content**" (or depth) of our sectors, and is based upon our sample of 1181 English entrepreneurs. The results are reflected in Table 5:

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Table 5

Parameters	Estimates	Std. err.	Est./s.e.	Prob.	Gradient
Const	0.8429	2.7994	0.301	0.3817	0.0007
Birth	-0.0001	0.0015	-0.045	0.4821	-0.1198
Appr	-0.0317	0.1275	-0.249	0.4017	-0.0000
ArtAppr **	0.2694	0.1393	1.933	0.0266	-0.0004
EconLaw	0.1171	0.2110	0.555	0.2895	-0.0001
SciArch ***	0.9975	0.1543	6.463	0.0000	-0.0003
VarUnf	0.0418	0.1485	0.282	0.3891	0.0001
Public **	0.4104	0.2019	2.033	0.0210	-0.0001
Sec	0.1091	0.1455	0.750	0.2266	0.0001
NoUnk : reference					
NS *	0.3400	0.1929	1.763	0.0390	0.0005
NH	0.1465	0.1460	1.004	0.1578	-0.0004
S **	0.2242	0.1017	2.206	0.0137	-0.0000
H: reference					

The conclusions are not surprising. There is one novelty, though: when we take into account the technological content of sectors, articled apprenticeship (**ArtAppr**) becomes, for the first time, positive and significant at the 95% level. This seems natural (articled apprenticeships are very akin to engineering or professional studies) and increases the confidence we have in the consistence of our database. Straight apprenticeship, in exchange, is small, negative, and not significant. The other strong and significant educational variables are **SciArch** (significant at the 99% level) and **Public** (at the 95% level).

Regarding degree of entrepreneurial self-sufficiency the results are also quite easy to explain: while not very high, **S** is positive and significant at the 95% level and **NS** a little higher and significant at the 90% level. This means that self-made and nearly self-made are the types of entrepreneurs who were active in technologically innovative sectors, while those who inherited their businesses were less innovative: another logical outcome. Again, these results justify our confidence in the quality of our data.

Our last run refers to **adaptability to changes in demand**: here the sectors have been weighted according to their being considered of strong, medium, or weak demand and weighted accordingly (0.3, 0.2, and 0.1 respectively). The sample is the same as before and the results are as in Table 6:

Table 6

```
---------------------------------------------------------------------------------------------------------
Parameters      Estimates    Std. err.   Est./s.e.  Prob.   Gradient
---------------------------------------------------------------------------------------------------------
Const **         0.9644       0.3835      2.515     0.0060   -0.0144
Birth **        -0.0005       0.0002     -2.281     0.0113  -33.0950
Appr *           0.0309       0.0176      1.759     0.0393    0.0595
ArtAppr          0.0286       0.0195      1.465     0.0714    0.0699
EconLaw ***      0.1159       0.0287      4.045     0.0000    0.0418
SciArch ***      0.1570       0.0211      7.443     0.0000    0.0170
VarUnf           0.0052       0.0205      0.256     0.3989   -0.1563
Public ***       0.0935       0.0276      3.391     0.0003    0.0092
Sec              0.0429       0.0202      2.128     0.0167    0.0558
NoUnk: reference
NS ***           0.0968       0.0260      3.726     0.0001    0.0021
NH **            0.0448       0.0199      2.250     0.0122    0.0434
S *              0.0265       0.0140      1.892     0.0292    0.1093
H: reference
```

The results here again tend to confirm our hypotheses. The highest and most significant variables are those related with college or university training, **SciArch** and **EconLaw**, closely followed by **Public**, with **Appr** a very distant fourth both in terms of significance and of value of coefficient. We find extremely interesting that economists and lawyers, while not very strong on technology, according to the previous Table, seem much more able to adapt to changes in demand. For the second time we find a table where **Birth** has high significance and a negative sign. Our interpretation here is that, as time went on and the technological level increased, versatility, shifting from one sector to another, became more difficult. Our example of carpenters in aeronautics would apply here.

Regarding self-sufficiency, we find that **NS**, **NH**, and **S**, in this order, were able to adapt to changes in demand in different degrees. Unsurprisingly, the less amenable to adapt to demand change appear to be the heirs, stuck as they were to the businesses and sectors they inherited.

Final considerations

Our results are far from conclusive. It is our immediate purpose to enlarge our Spanish sample so as to make it more homogeneous and thereby facilitate further comparison with the English sample. However, it is encouraging that the data gathered and processed so far seem to confirm our rather simple and commonsensical hypotheses that education has a beneficial influence upon entrepreneurial activity, and that college and university education (with the addition of public schools) improve the versatility and overall performance of entrepreneurs. In

other words, that nurture is an important part of entrepreneurship. Nature can be improved upon.

APPENDIX A: ELITE ENGLISH ENTREPRENEURS

ELITE ENGLISH ENTREPRENEURS	Century	ELITE ENGLISH ENTREPRENEURS	Century
Aitken, William Maxwell-1st Lord Beaverbrook	20th	D'Arcy, William, Knox	19th
Arsmtrong, William George	19th	De Ferranti, Sebastian Ziani	20th
Austin, Herbert	20th	De Havilland, Sir Geoffrey	20th
Bagnall, John Nock	19th	Deloitte, William Welch	19th
Baldwin, Alfred	19th	Doulton, Sir Henry	19th
Barford, Edward James	20th	Ellerman, Sir John Reeves	20th
Barham, Sir George	19th	Ellis, John Devonshire	19th
Baring, John	20th	Ferguson, Henry George	20th
Barlow, Sir Robert	20th	Firth, Mark	19th
Baron, Bernhard	20th	Foley, Patrick James	19th
Barratt, Arthur William	20th	Foster, William	19th
Bartlett, Sir Charles John	20th	Fry, Joseph Storrs	19th
Bartlett, Sir Herbert Henry	19th	Furness, Christopher-1st Lord Furness of Grantley	19th
Beatty, Sir Alfred Chester	20th	Gamble, Sir David	19th
Beecham, Sir Joseph	19th	Gestetner, David	20th
Beecham, Thomas	19th	Gibbs, Henry Hucks-1st Lord Aldenham	19th
Beit, Alfred	19th	Goldie-Taubman, Sir George Daswood	19th
Bell, Sir Isaac Lowthian	19th	Gollancz, Sir Victor	20th
Belling, Charles Reginald	20th	Gossage, William	19th
Bellman, Sir Charles Harold	20th	Grenfell, Arthur Morton	20th
Benn, Sir Ernest John Pickstone	20th	Guinness, Edward Cecil-1st Earl of Iveagh	20th
Berry, James Gomer, 1st Viscount Kemsley	20th	Hadfield, Sir Robert Abbott	20th
Bessemer, Sir Henry	19th	Hambro, Sir Everard Alexander	19th
Blackwell, Richard	20th	Harland, Sir Edward James	19th
Bolckow, Henry William Ferdinand	19th	Harmsworth, Alfred Charles William-1st Viscount of St. Peter in the County of Kent	20th
Bolitho, Tomas Bedford	19th	Harmsworth, Harold Sidney-1st Viscount Rothermere of Hemsted	20th
Bolton, Sir George Lewis French	20th	Haslam, Sir Alfred Seale	20th
Boot, Jesse, 1st Lord Trent of Nothingham	20th	Hattersley, Richard Longden	19th
Bowater, Sir Eric (Frederick) Vansittart	20th	Heath II, Robert	19th
Broadhurst, Sir Edward Tootal	19th	Heath, Cuthbert Eden	20th
Brookes, Raymond Percival	20th	Hewlett, Alfred	19th
Brown, Sir John	19th	Hickman, Sir Alfred	19th
Browne, Sir Benjamin Chapman	19th	Hingley, Sir Benjamin	19th
Brunner, Sir John Tomlinson	19th	Hirst, Hugo-1st Lord Hirst of Witton	20th
Bryant, Wilberforce	19th	Holden, Sir Edward Hopkinson	19th
Burton, Sir Montague Maurice	20th	Hollins, Sir Frank	19th
Butlin, Sir William Heygate Edmund Colbourne	20th	Houldsworth, Sir William Henry	19th
Cadbury, George	19th	Hulton, Sir Edward	19th
Cadbury, Laurence John	20th	Illingworth, Alfred	19th
Cadman, John-1st Lord Cardman of Silverdale	20th	Inman, William	19th
Cassel, Sir Ernest Joseph	20th	Isaacs, Godfrey Charles	19th
Cavendish, William, 7th Duke of Devonshire	19th	Ismay, Thomas Henry	19th
Chadwick, David	19th	Jephcott, Sir Harry	20th
Chamberlain, Arthur	19th	Johnson, Claude Goodman	20th
Chamberlain, Joseph	19th	Johnston, John Lawson	19th
Chancellor, Sir Christopher John Howard	20th	Joseph, Sir Maxwell	20th
Clark, Alfred Corning	20th	Keen, Arthur	19th
Cockshut, John	19th	Korda, Sir Alexander	20th
Cohen, Sir John Edward	20th	Lane, Sir Allen	20th
Collins, Douglas Raymond	20th	Lawson, Edward Lewy-1st Lord Burnham of Hall Barn	19th
Colman, Jeremiah James	19th	Lee, Henry	19th
Colston, Sir Charles Blampied	20th	Lee, Sir Joseph Cocksey	19th
Combe, Simon Harvey	20th	Lever, William Hesketh-1st Viscount Leverhulme of the Western Isles	20th
Cook, John Mason	19th	Lewis, John Spedan	20th
Cook, Thomas	19th	Lewis, William Thomas-1st Lord Merthyr of Senghenydd	19th
Courtauld III, Samuel	19th	Liberty, Sir Arthur Lasenby	19th
Courtauld, IV, Samuel	20th	Lipton, Sir Thomas Johnstone	20th
Crossley, Francis William	19th	Llewellyn, Sir David Richard	20th
Crossley, Sir William John	19th	Longman, Charles James	19th
Crowther, Geoffrey	20th	Lyle, Charles Ernest Leonard-1st Lord Lyle of Westbourne	20th
Currie, Sir Donald	19th	Lyons, Sir William	20th

ELITE ENGLISH ENTREPRENEURS	Century	ELITE ENGLISH ENTREPRENEURS	Century
Dalziel, Davison Alexander-Lord Dalziel of Wooler	20th	Lysaght, John	19th
ELITE ENGLISH ENTREPRENEURS	**Century**	**ELITE ENGLISH ENTREPRENEURS**	**Century**
Mackintosh, Harold Vincent-1st Viscount Mackintosh of Halifax	20th	Sieff, Israel Moses-Lord Sieff of Brimpton	20th
Mackintosh, John	19th	Siemens, Sir Charles William	19th
Manfield, Sir Moses Philip	19th	Simon, Ernest Emil Darwin-1st Lord Simon of Wythenshawe	20th
Marks, Michael	19th	Simon, Henry	19th
Marks, Simon-1st Lord Marks of Broughton	20th	Simpson, Samuel Leonard	20th
Matheson, Hugh Mackay	19th	Sopwith, Sir Thomas Octave Murdoch	20th
Mitchell, Sir Godfrey Way	20th	Spurrier, Sir Henry	20th
Mond, Alfred Moritz-1st Lord Melchett of Landford	20th	Stamp, Josiah Charles-1st Lord Stamp of Shortlands	20th
Mond, Ludwig	19th	Stevens, Marshall	20th
Morris, William	20th	Steward-Liberty, Arthur Ivor	20th
Morrison, Charles	19th	Stokes, Donald Gresham-Lord Stokes of Leyland, Lancashire	20th
Mountain, Sir Edward Mortimer	20th	Stoll, Sir Oswald	20th
Newness, Sir George	19th	Swan, Sir Joseph Wilson	19th
Nixon, John	19th	Tate, Sir Henry	19th
Owen, Sir Alfred George Beech	20th	Thomas, Richard	19th
Parsons, The Honourable Sir Charles Algernon	20th	Thomas, Sidney Gilchrist	19th
Pasold, Sir Eric Walter	20th	Thorn, Sir Jules	20th
Pearson, Weetman Dickinson-1st Viscount Cowdray	20th	Thornycroft, Sir Jonh Isaac	19th
Perkin, Sir William Henry	19th	Touche, Sir George Alexander	20th
Perkins, Francis Arthur	20th	Twining, III Richard	19th
Philipps, John Wynord-1st Viscount St Davids of Lydstep Haven	20th	Unwin, Sir Stanley	20th
Philipps, Owen Cosby-Lord Kylsant of Carmarthen	20th	Van den Bergh, Henry	20th
Pilkington, William Henry-1st Lord Pilkington of St Helens	20th	Vestey, William-1st Lord Vestey of Kingswood	20th
Pirrie, William James-Viscount Pirrie	19th	Vickers, Albert	20th
Rank, Joseph Arthur-Lord Rank of Sutton Scotney	20th	Vickers, Thomas Edward	19th
Ransome, James Edward	19th	Ward, William Humble Eric-3rd Earl of Dudley	20th
Reuter, Paul Julius-1st Baron de Reuter	19th	Waterhouse, Edwin	19th
Richardson, John Wigham	19th	Wedgwood, Josiah	20th
Rolls, The Honourable Charles Steward	19th	Weir, William Douglas-1st Viscount Weir of Eastwood	20th
Rootes, William Edward-1st Lord Rootes of Ramsbury	20th	Wellcome, Sir Henry Solomon	20th
Rothschild, Nathan Meyer-1st Lord Rothschild of Tring, Hertfordshire	19th	Wernher, Sir Julius Carl	19th
Rowntree, Joseph	20th	Weston, William Garfield	20th
Royce, Sir Frederick Henry	20th	Whitbread, Francis Pelham	20th
Rylands, John	19th	White, Sir George	19th
Sainsbury, John James	20th	Whitworth, Sir Joseph	19th
Salt, Sir Titus	19th	Williams, Sir George	19th
Samuel, Marcus-1st Viscount Bearsted	20th	Wills, William Henry-Lord Winterstoke of Blagdon	19th
Selfridge, Harry Gordon	20th	Wilson, Charles Henry-1st Lord Nunburnholme of the City of Kingston-upon-Hull	19th
Siddeley, Jonh Davenport-1st Lord Kenilworth	20th	Wyatt, Sir Myles Dermot Norris	20th

APPENDIX B: NOTES

TABLE B.1. EXPLANATIONS TO CATEGORIES OF STUDIES

No studies	No studies or only elementary (less than14 years)
Unknown	
Apprenticeship	
Articled Apprenticeship	Lawyer/Barrister, Patent Agent, Articled Architecture, Auditor, Accountant, Electrician, Textile Engineering, Pharmacist, Treasury Department Official, Engineering in various fields (mechanics, electricity, mining, chemistry, naval, railroad), seaman, topographer, professional training in qualified institutions (Birmingham College of Technology, University College School, Belfast College of Technology, Royal Tecnhical College of Glasgow, etc)
Secondary Studies	Ordinarily until 17 years
Public School	Charterhouse, Cheltenham, Clifton, Eton, Haileybury, Harrow, Malvern, Marlborough, Radley, Repton, Rossall, Rugby, St Paul's School, Sherborne, Uppingham, Westminster y Winchester; Bedford, Bradfield, Dulwich, Fettes, Glenalmond, Loretto, Merchant Taylor's School, Oakham, Oundle, Sedbergh, Shrewsbury, Tonbridge, Wellington; Brighton, Dover, Lancing, Epsom, City of London Freemen's School, City of London School
Engineeríng/Architecture	
Law	
Economics	
Sciences	Biochemistry, Botany, Science, Applied Science, Mechanical Science, Pharmacy, Physics-Chemistry and Physiology, Geology, Mathematics, Medicine, Chemistry, Metallurgical Chemistry, Veterinary Science, Electricity-Physics-Mathematics, Mathematical-Physics, Mining Engineering-Geology, Engineering-Mathematical-Physics
Various Fields, Multidisciplinary, Unspecified College and University Studies	Unspecified, Science/Law, Classics/Law, Law/Mathematics, Economics/History/Law, Economics/Engineering, Economics/Law, Philosophy/Economics, Philosophy/Law, Physics/Law, Modern History/Law, Engineering/Economics, Literature/Science
Unfinished College or University Studies	
Miscellany	Academy, Military Science and Engineering, Moral Science, Classics, Ecclesiastical Studies, History, Modern History, History/Auditing, Philology, Literature, Fine Arts, Schoolteaching, Theology, Diplomacy.

TABLE B.2. EXPLANATIONS TO SECTORS

Food and Agriculture	Agriculture and manufacturing of food, drink and tobacco
Automobile-Aeronautics	Design and Manufacture of bicycles, motorcycles, cars, aeroplanes, aircrafts and specific parts thereof (engines, motors, turbines, clutches, tyres etc.) and their workshops
Banking	Banking, stockdealing, finance
Commerce	Import-export, commerce and trade, wholesale and retail
Communication	Actors, agents and impresarios, advertising agents, cinema (including distribution) and stage theaters, publishing, dailies, weeklies and magazines, photography, printing, musical industry
Building-Real estate	Building, Real estate agency, production and manufacturing of primary and intermediary building materials (concrete, quarries, pipes, floors, ceilings, tiles, bricks, window glass, wallpaper); wood processing; architectural design, contractors and projectors, including public works
Consumption	Ceramics, stamp collecting, silverware, fashion, furniture, house appliances, matches, needles, office and business machines and wares, scientific and medical instruments, optical and photographic instruments, drafting, drawing and designing instruments, mathematical and measurement instruments, including watches and calculators, musical instruments, porcelain, china, glass, bathroom fittings, lamps, toys, ink, art dealers, surgical bandages, paper napkins, sanitary towels
Power	Electricity, gas, petroleum, agrícultural engines, nuclear power, petrochemicals and personnel working in these sectors
Electrical equipment	Electrical and electronic parts, cables, turbines, computers and related instruments
Metallurgy and machine building	Shipbuilding, shipyards, armament and weapons industry, machinery (including agricultural), hardware, engineering equipment, metallurgy of diverse metals (lead, tin, nickel, precious metals, etc.), nuts and bolts, railroad parts and material, turbine parts, fire repellents, furnaces, ovens, and mills
Mining	
Chemicals	In addition to Basic chemicals it includes soap and soda, pharmaceuticals, drugs, paint, perfumes, fertilizers, alkaloids, plastics, synthetic dyes, etc. and paper
Insurance	
Services	Legal work, auditing, accounting, consulting, counseling, tourism, funeral services
Iron and steel	Iron and steel manufacturing and closely related activities
Textiles	Manufacturing of textiles, clothing, footwear, and leatherwork
Transportation	Railroad, shipping, airlines, road transportation
Various	Directors, executives, managers, officers, foremen (of private and public companies), speculators, business promotors, union officials, exhibition organizers, college professors, , cooperative organizers, heirs of great fortunes, ocial philosophers, leaders of business associations, politicians, business organizers, inventors

NOTE: Directos, executives, managers, etc. in a single sector are included in that sector and not in "Various"

TABLE B.3. CLASSIFICATION OF SECTORS ACCORDING TO DEMAND STRENGTH AND TECHNOLOGICAL DEPTH

	Strength of demand	Tecnological depth
Food and Agriculture	Medium	0,2
Automobile-aeronautics	Medium	2,7
Banking	Medium	0,5
Commerce	Medium	0,1
Communication	Medium	1
Building-Real estate	Weak	0,4
Consumption	Strong	2
Power	Strong	0,2
Electrical equipment	Strong	3,5
Metallurgy-Machine building	Medium	1,2
Mining	Weak	0,5
Chemicals	Strong	2,9
Insurance	Medium	0,5
Services	Medium	0,1
Iron and Steel	Weak	0,5
Textiles	Weak	0,1
Transportation	Medium	1
Various	Weak	0,1

Source: Segura, *et al*. (1989), based upon EUROSTAT, OCDE and other official sources.

NOTE: The classification of Banking, Commerce, Communication, Insurance, Transportation and Various has been made by us on the basis of fragmentary information

APPENDIX C: TABLES

TABLE C.1.1. EDUCATIONAL LEVEL OF SPANISH ENTREPRENEURS

	ALL		SPANISH		VALENCIANS		CATALANS	
	(1) N°	(2) %	(3) N°	(4) %	(5) N°	(6) %	(7) N°	(8) %
(1) No studies	64	22,22	13	12,87	39	34,21	15	14,29
(2) Unknown	33	11,46	11	10,89	13	11,40	17	16,19
(3) Apprenticeship	35	12,15	10	9,90	14	12,28	14	13,33
(4) Articled Apprenticeship								
(5) Secondary Education	6	2,08	2	1,98	3	2,63	1	0,95
(6) Public School								
(7) Engineer/Architect	47	16,32	23	22,77	6	5,26	23	21,90
(8) Law	40	13,89	23	22,77	12	10,53	11	10,48
(9) Economics	31	10,76	10	9,90	14	12,28	10	9,52
(10) Sciences	13	4,51	3	2,97	6	5,26	6	5,71
(11) Cross-disciplinary and Unknown University Studies								
(12) Unfinished University Studies	7	2,43	2	1,98	3	2,63	4	3,81
(13) Miscellany	12	4,17	4	3,96	4	3,51	4	3,81
(14) TOTAL	288	100	101	100	114	100	105	100

SUMMARY

	ALL		SPANISH		VALENCIANS		CATALANS	
	(1) N°	(2) %	(3) N°	(4) %	(5) N°	(6) %	(7) N°	(8) %
(1) No studies and Unknown	97	33,68	24	23,76	52	45,61	32	30,48
(2) Apprenticeship and Articled Apprenticeship	35	12,15	10	9,90	14	12,28	14	13,33
(3) Secondary Education	6	2,08	2	1,98	3	2,63	1	0,95
(4) Public School				0,00		0,00		0,00
(5) University Studies	150	52,08	65	64,36	45	39,47	58	55,24
(6) TOTAL	288	100,00	101	100	114	100	105	100

TABLE C.1.2. EDUCATIONAL LEVEL OF ENGLISH ENTREPRENEURS FROM (JI)

	ALL		NO MANAGER		MANAGER		102 SELECTED 20th		100 SELECTED 19th	
	(1) Nº	(2) %	(3) Nº	(4) %	(5) Nº	(6) %	(7) Nº	(8) %	(9) Nº	(10) %
(1) No studies	169	14,31	149	16,07	20	7,87	12	11,76	14	14,00
(2) Unknown	93	7,87	82	8,85	11	4,33	4	3,92	5	5,00
(3) Apprenticeship	201	17,02	184	19,85	17	6,69	14	13,73	26	26,00
(4) Articled Apprenticeship	154	13,04	94	10,14	60	23,62	10	9,80	11	11,00
(5) Secondary Education	148	12,53	121	13,05	27	10,63	14	13,73	16	16,00
(6) Public School	55	4,66	45	4,85	10	3,94	6	5,88	4	4,00
(7) Engineer/Architect	65	5,50	41	4,42	24	9,45	9	8,82	2	2,00
(8) Law	30	2,54	13	1,40	17	6,69	2	1,96	1	1,00
(9) Economics	24	2,03	17	1,83	7	2,76	9	8,82		0,00
(10) Sciences	53	4,49	41	4,42	12	4,72	4	3,92	7	7,00
(11) Cross-disciplinary and Unknown University Studies	93	7,87	68	7,34	25	9,84	6	5,88	9	9,00
(12) Unfinished University Studies	43	3,64	34	3,67	9	3,54	7	6,86	2	2,00
(13) Miscellany	53	4,49	38	4,10	15	5,91	5	4,90	3	3,00
(14) TOTAL	1181	100	927	100	254	100	102	100	100	100

SUMMARY

	ALL		NO MANAGER		MANAGER		102 SELECTED 20th		100 SELECTED 19th	
	(1) Nº	(2) %	(3) Nº	(4) %	(5) Nº	(6) %	(7) Nº	(8) %	(9) Nº	(10) %
(1) No studies and Unknown	262	22,18	231	24,92	31	12,20	16	15,69	19	19,00
(2) Apprenticeship and Articled Apprenticeship	355	30,06	278	29,99	77	30,31	24	23,53	37	37
(3) Secondary Education	148	12,53	121	13,05	27	10,63	14	13,73	16	16,00
(4) Public School	55	4,66	45	4,85	10	3,94	6	5,88	4	4,00
(5) University Studies	361	30,57	252	27,18	109	42,91	42	41,18	24	24,00
(6) TOTAL	1181	100	927	100	254	100	102	100	100	100

TABLE C.1.3. EDUCATIONAL LEVEL OF ENGLISH ENTREPRENEURS FROM (JII)

	ALL		ONLY NEW		MANAGER		NO MANAGER		INCLUDED IN BOTH BOOKS		ALL OF BOTH BOOKS	
	(1) Nº	(2) %	(3) Nº	(4) %	(5) Nº	(6) %	(7) Nº	(8) %	(9) Nº	(10) %	(11) Nº	(12) %
(1) No studies	57	7,60	32	6,03	26	6,55	31	8,78	25	11,42	201	11,74
(2) Unknown	54	7,20	46	8,66	31	7,81	23	6,52	8	3,65	139	8,12
(3) Apprenticeship	61	8,13	32	6,03	26	6,55	35	9,92	29	13,24	233	13,61
(4) Articled Apprenticeship	73	9,73	41	7,72	43	10,83	30	8,50	32	14,61	195	11,39
(5) Secondary Education	99	13,20	67	12,62	46	11,59	53	15,01	32	14,61	215	12,56
(6) Public School	45	6,00	29	5,46	18	4,53	27	7,65	16	7,31	84	4,91
(7) Engineer/Architect	61	8,13	47	8,85	42	10,58	19	5,38	14	6,39	112	6,54
(8) Law	40	5,33	33	6,21	23	5,79	17	4,82	7	3,20	63	3,68
(9) Economics	39	5,20	28	5,27	22	5,54	17	4,82	11	5,02	52	3,04
(10) Sciences	23	3,07	13	2,45	14	3,53	9	2,55	10	4,57	66	3,86
(11) Cross-disciplinary and Unknown University Studies	127	16,93	113	21,28	68	17,13	59	16,71	14	6,39	206	12,03
(12) Unfinished University Studies	17	2,27	7	1,32	6	1,51	11	3,12	10	4,57	50	2,92
(13) Miscellany	54	7,20	43	8,10	32	8,06	22	6,23	11	5,02	96	5,61
(14) TOTAL	750	100	531	100	397	100	353	100	219	100	1712	100

SUMMARY

	ALL		ONLY NEW		MANAGER		NO MANAGER		INCLUDED IN BOTH BOOKS		ALL OF BOTH BOOKS	
	(1) Nº	(2) %	(3) Nº	(4) %	(5) Nº	(6) %	(7) Nº	(8) %	(9) Nº	(10) %	(11) Nº	(12) %
(1) No studies and Unknown	111	14,80	78	14,69	57	14,36	54	15,30	33	15,07	340	19,86
(2) Apprenticeship and Articled Apprenticeship	134	17,87	73	13,75	69	17,38	65	18,41	61	27,85	428	25
(3) Secondary Education	99	13,20	67	12,62	46	11,59	53	15,01	32	14,61	215	12,56
(4) Public School	45	6,00	29	5,46	18	4,53	27	7,65	16	7,31	84	4,91
(5) University Studies	361	48,13	284	53,48	207	52,14	154	43,63	77	35,16	645	37,68
(6) TOTAL	750	100	531	100	397	100	353	100	219	100	1712	100

TABLE C.2.1. DEGREE OF SELF-SUFFICIENCY OF SPANISH BUSINESSMEN

	ALL		SPANISH		VALENCIANS		CATALANS	
	(1) Nº	(2) %	(3) Nº	(4) %	(5) Nº	(6) %	(7) Nº	(8) %
(1) SELF	141	48,96	48	47,52	59	51,75	46	43,81
(2) HEIR	90	31,25	24	23,76	41	35,96	33	31,43
(3) NHEIR	27	9,38	12	11,88	5	4,39	12	11,43
(4) NSELF	30	10,42	17	16,83	9	7,89	14	13,33
(5) TOTAL	288	100	101	100	114	100	105	100

TABLE C.2.2. DEGREE OF SELF-SUFFICIENCY OF ENGLISH ENTREPRENEURS FROM JI

	ALL		NO MANAGER		MANAGER		102 SELECTED 20th		100 SELECTED OF 19th	
	(1) Nº	(2) %	(3) Nº	(4) %	(5) Nº	(6) %	(7) Nº	(8) %	(9) Nº	(10) %
(1) SELF	673	56,99	474	51,13	199	78,35	50	49,02	53	53,00
(2) HEIR	304	25,74	291	31,39	13	5,12	26	25,49	27	27,00
(3) NHEIR	140	11,85	113	12,19	27	10,63	17	16,67	14	14,00
(4) NSELF	64	5,42	49	5,29	15	5,91	9	8,82	6	6,00
(5) TOTAL	1181	100	927	100	254	100	102	100	100	100

TABLE C.2.3. DEGREE OF SELF-SUFFICIENCY OF ENGLISH ENTREPRENEURS FROM JII

	ALL		ONLY NEW		MANAGER		NO MANAGER		INCLUDED IN BOTH BOOKS		ALL OF BOTH BOOKS	
	(1) Nº	(2) %	(3) Nº	(4) %	(5) Nº	(6) %	(7) Nº	(8) %	(9) Nº	(10) %	(11) Nº	(12) %
(1) SELF	484	64,53	360	67,80	342	86,15	142	40,23	124	56,62	1033	60,34
(2) HEIR	179	23,87	129	24,29	21	5,29	158	44,76	50	22,83	433	25,29
(3) NHEIR	49	6,53	20	3,77	19	4,79	30	8,50	29	13,24	160	9,35
(4) NSELF	38	5,07	22	4,14	15	3,78	23	6,52	16	7,31	86	5,02
(5) TOTAL	750	100	531	100	397	100	353	100	219	100	1712	100

TABLE C.3.1. ECONOMIC SECTORS IN WHICH ENTREPRENEURS WORKED (%)

	(1) ALL SPANISH	(2) VALENCIAN	(3) CATALANS	(4) 101 SPANISH	(5) ENGLISH JI (N°= 1181)	(6) 102 ELECTED 20th	(7) 100 ELECTED 19th	(8) ENGLISH JII (N=750)	(9) ALL ENGLISH (JI and JII) (N°=1712)
(1)Agriculture & Food	13,60	16,67	12,08	13,97	5,82	9,21	6,34	7,12	6,44
(2)Automobile & Aeronautics	1,72	1,61	2,42	1,68	7,25	10,53	3,52	6,34	6,39
(3)Banking	14,18	9,68	12,56	18,44	7,12	6,58	5,63	8,12	7,47
(4)Commerce	6,13	7,53	6,76	2,23	7,52	7,89	9,86	6,34	7,05
(5)Communication & Show Business	4,41	4,30	5,31	3,91	6,21	11,84	6,34	6,23	6,34
(6)Building & Real State	10,34	15,59	5,80	10,61	5,23	4,61	2,11	4,34	5,12
(7)Consumer Industries	3,07	5,91	0,97	3,35	4,84	6,58	1,41	3,56	4,56
(8)Power	4,21	1,08	5,80	6,15	4,58	1,97	1,41	4,34	4,37
(9)Electric Equipment	0,96		1,93	0,56	2,16	1,97	2,11	3,11	2,40
(10)Metallurgy & Machine Building	5,17	2,69	8,21	5,03	9,48	5,92	14,79	5,67	8,18
(11) Mining	1,92		0,48	5,03	3,73	1,97	6,34	3,23	3,71
(12)Chemistry	7,09	4,84	9,66	8,38	4,71	7,89	6,34	4,67	4,46
(13)Insurance	1,53		1,93	3,35	1,57	1,97	0,70	2,11	1,79
(14)Services	4,60	7,53	1,93	2,79	3,53	4,61	4,23	2,11	3,15
(15)Iron & Steel	2,87	1,61	1,93	5,03	4,25	1,97	12,68	4,89	4,32
(16)Textiles	11,30	12,90	16,43	4,47	6,54	3,29	8,45	5,90	6,30
(17)Transportation	5,75	7,53	3,86	4,47	10,07	7,89	6,34	12,35	10,86
(18)Miscellany	1,15	0,54	1,93	0,56	5,42	3,29	1,41	9,57	7,10
(19)Total	100	100	100	100	100	100	100	100	100

TABLE C.4.1.a. SPANISH ENTREPRENEURS, EDUCATION LEVELS AND ECONOMIC SECTORS
ABSTRACT

	(1) NO STUDIES AND UNKNOWN	(2) APPRENTICESHIP AND ARTICLED APPRENTICESHIP	(3) SECONDARY EDUCATION	(4) PUBLIC SCHOOL	(5) UNIVERSITY STUDIES	(6) TOTAL
(1)Agriculture & Food	30	5	3		33	71
(2)Automobile & Aeronautics	3	1			5	9
(3)Banking	24	6	2		42	74
(4)Commerce	12	8	1		11	32
(5)Communication & Show Business	5	1			17	23
(6)Building & Real State	17	4			33	54
(7)Consumer Industries	6	4			6	16
(8)Power	3	2	1		16	22
(9)Electric Equipment					5	5
(10)Metallurgy & Machine Building	7	4	1		15	27
(11) Mining	2	2			6	10
(12)Chemistry	5	4			28	37
(13)Insurance	1				7	8
(14)Services	9	4			11	24
(15)Iron & Steel	3				12	15
(16)Textiles	29	11	2		17	59
(17)Transportation	10	3			17	30
(18)Miscellany		1			5	6
(19)SECTORS	166	60	10		286	522
(20)ENTREPRENEURS	97	35	6		150	288
(21)AVERAGE	1,71	1,71	1,67		1,91	1,81
(22)STANDARD DEVIATION	9,27	2,66	0,75		10,83	21,31

TABLE C.4.1.b. SPANISH ENTREPRENEURS, EDUCATION LEVELS AND ECONOMIC SECTORS

	(1) No studies	(2) Unknown	(3) Apprenticeship	(4) Articled Apprenticeship	(5) Secondary Education	(6) Public School	(7) Engineer/ Architect	(8) Law	(9) Economics	(10) Sciences	(11) Cross-disciplinary and Unknown University Studies	(12) Unfinished University Studies	(13) Miscellany	(14) TOTAL
(1)Agriculture & Food	20	10	5		3		8	8	7	3		4	3	71
(2)Automobile & Aeronautics	2	1	1				3	1					1	9
(3)Banking	12	12	6		2		13	18	6			1	4	74
(4)Commerce	11	1	8		1		2	2	2			1	4	32
(5)Communication & Show Business	1	4	1				5	4	3			1	4	23
(6)Building & Real State	14	3	4				14	7	6	4		2		54
(7)Consumer Industries	5	1	4					1	1	1			3	16
(8)Power	3		2		1		10	3	2				1	22
(9)Electric Equipment							4			1				5
(10)Metallurgy & Machine Building	7		4		1		8	3	1			2	1	27
(11) Mining	1	1	2				3	3						10
(12)Chemistry	3	2	4				11	2	9	6				37
(13)Insurance	1						1	4		1		1		8
(14)Services	6	3	4				1	3	5	1			1	24
(15)Iron & Steel	3						4	5	1	1			1	15
(16)Textiles	15	14	11		2		5	4	5	1		1	1	59
(17)Transportation	8	2	3				6	5	4	2				30
(18)Miscellany			1				2		2				1	6
(19)SECTORS	112	54	60		10		100	73	54	21		13	25	522
(20)ENTREPRENEURS	64	33	35		6		47	40	31	13		7	12	288
(21)AVERAGE	1,75	1,64	1,71		1,67		2,13	1,83	1,74	1,62		1,86	2,08	1,81
(22)STANDARD DEVIATION	5,65	4,50	2,66		0,75		21,91	3,94	2,45	1,64		0,99	1,32	21,31

TABLE C. 4.2.a. "ELITE" SPANISH ENTREPRENEURS, EDUCATION LEVELS AND ECONOMIC SECTORS
(Nº=101)
ABSTRACT

	(1) NO STUDIES AND UNKNOWN	(2) APPRENTICESHIP AND ARTICLED APPRENTICESHIP	(3) SECONDARY EDUCATION	(4) PUBLIC SCHOOL	(5) UNIVERSITY STUDIES	(6) TOTAL
(1) Agriculture & Food	11	2			12	25
(2)Automobile & Aeronautics	1				2	3
(3)Banking	5	1	1		26	33
(4)Commerce		2			2	4
(5)Communication & Show Business	1				6	7
(6)Building & Real State	6	1			12	19
(7)Consumer Industries	1	3			2	6
(8)Power	2				9	11
(9)Electric Equipment					1	1
(10)Metallurgy & Machine Building		1	1		7	9
(11) Mining	2	1			6	9
(12)Chemistry	1	2			12	15
(13)Insurance	1				5	6
(14)Services	1	2			2	5
(15)Iron & Steel	2				7	9
(16)Textiles	5				3	8
(17)Transportation	2				6	8
(18)Miscellany					1	1
(19)SECTORS	41	15	2		121	179
(20)ENTREPRENEURS	24	10	2		65	101
(21)AVERAGE	1,71	1,50	1,00		1,86	1,77
(22)STANDARD DEVIATION	2,79	0,67	0,00		5,93	8,11

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TABLE C.4.2.B. "ELITE" SPANISH ENTREPRENEURS, EDUCATION LEVELS AND ECONOMIC SECTORS
(Nº=101)

	(1) No studies	(2) Unknown	(5) Apprenticeship	(6) Articled Apprenticeship	(5) Secondary Education	(6) Public School	(7) Engineer/ Architect	(8) Law	(9) Economics	(10) Sciences	(11) Cross-disciplinary and Unknown University Studies	(12) Unfinished University Studies	(13) Miscellany	(14) TOTAL
(1)Agriculture & Food	5	6	2				2	3	3			3	1	25
(2)Automobile & Aeronautics	1							1					1	3
(3)Banking	4	1	1		1		7	12	5				2	33
(4)Commerce			2						1				1	4
(5)Communication & Show Business		1					3	2	1					7
(6)Building & Real State	4	2	1				8	3		1				19
(7)Consumer Industries	1		3						1				1	6
(8)Power	2						5	2	2					11
(9)Electric Equipment							1							1
(10)Metallurgy & Machine Building			1		1		4	2	1					9
(11) Mining	1	1	1				3	3						9
(12)Chemistry		1	2				5	1	4	2				15
(13)Insurance	1							4		1				6
(14)Services	1		2				1		1					5
(15)Iron & Steel	2						1	4	1				1	9
(16)Textiles	1	4						1	2					8
(17)Transportation	1	1					2	3	1					8
(18)Miscellany													1	1
(19)SECTORS	24	17	15		2		42	42	22	4		3	8	179
(20)ENTREPRENEURS	13	11	10		2		23	23	10	3		2	4	101
(21)AVERAGE	1,85	1,55	1,50		1,00		1,83	1,83	2,20	1,33		1,50	2,00	1,77
(22)STANDARD DEVIATION	1,41	1,76	0,67		0,00		2,25	2,70	1,35	0,47		0,00	0,35	8,11

TABLE C.4.3.a. ENGLISH ENTREPRENEURS, EDUCATION LEVELS AND ECONOMIC SECTORS
(Nº=1181)
ABSTRACT

	(1) NO STUDIES AND UNKNOWN	(2) APPRENTICESHIP AND ARTICLED APPRENTICESHIP	(3) SECONDARY EDUCATION	(4) PUBLIC SCHOOL	(5) UNIVERSITY STUDIES	(6) TOTAL
(1) Agriculture & Food	23	27	15	6	18	89
(2)Automobile & Aeronautics	16	47	11	2	35	111
(3)Banking	14	14	14	16	51	109
(4)Commerce	43	25	19	9	19	115
(5)Communication & Show Business	27	19	19	2	28	95
(6)Building & Real State	20	31	13	3	13	80
(7)Consumer Industries	18	20	5	4	27	74
(8)Power	10	23	5		32	70
(9)Electric Equipment	4	9	5	2	13	33
(10)Metallurgy & Machine Building	29	58	14	8	36	145
(11) Mining	11	14	5	4	23	57
(12)Chemistry	15	10	12	2	33	72
(13)Insurance	6	7	5	3	3	24
(14)Services	14	27		2	11	54
(15)Iron & Steel	12	18	6	4	25	65
(16)Textiles	28	31	17	4	20	100
(17)Transportation	34	38	21	9	52	154
(18)Miscellany	12	15	11	2	43	83
(19)SECTORS	336	433	197	82	482	1530
(20)ENTREPRENEURS	262	355	148	55	361	1181
(21)AVERAGE	1,28	1,22	1,33	1,49	1,34	1,30
(22)STANDARD DEVIATION	9,93	13,05	5,43	3,67	13,13	33,31

TABLE C.4.3.b. ENGLISH ENTREPRENEURS, EDUCATION LEVELS AND ECONOMIC SECTORS
(Nº=1181)

	(1) No studies	(2) Unknown	(7) Apprenticeship	(8) Articled Apprenticeship	(5) Secondary Education	(6) Public School	(7) Engineer/ Architect	(8) Law	(9) Economics	(10) Sciences	(11) Cross-disciplinary and Unknown University Studies	(12) Unfinished University Studies	(13) Miscellany	(14) TOTAL
(1)Agriculture & Food	15	8	21	6	15	6	1	1	2	5	4	4	1	89
(2)Automobile & Aeronautics	10	6	19	28	11	2	14	2	1	5	3	5	5	111
(3)Banking	8	6	11	3	14	16	1	7	5		19	5	14	109
(4)Commerce	28	15	23	2	19	9		1	3	2	2	5	6	115
(5)Communication & Show Business	16	11	13	6	19	2	4	3	4	2	9	2	4	95
(6)Building & Real State	14	6	21	10	13	3	2	2	1	1	3	3	1	80
(7)Consumer Industries	9	9	17	3	5	4	7	1	2	5	5	6	1	74
(8)Power	3	7	7	16	5		17	1	2	5	3	3	1	70
(9)Electric Equipment	1	3	1	8	5	2	6	1	1	2		2	1	33
(10)Metallurgy & Machine Building	18	11	33	25	14	8	9	5		8	3	2	9	145
(11) Mining	8	3	5	9	5	4	4	3		3	11		2	57
(12)Chemistry	10	5	7	3	12	2	3	1	3	19	2	3	2	72
(13)Insurance	3	3	2	5	5	3		1			2			24
(14)Services	7	7	3	24		2		1	2	2	6			54
(15)Iron & Steel	8	4	10	8	6	4	6	2		5	9	1	2	65
(16)Textiles	23	5	30	1	17	4		1	3	3	9		4	100
(17)Transportation	23	11	14	24	21	9	11	3	1	5	18	6	8	154
(18)Miscellany	11	1	4	11	11	2	3	6	3	5	16	4	6	83
(19)SECTORS	215	121	241	192	197	82	88	42	33	77	124	51	67	1530
(20)ENTREPRENEURS	169	93	201	154	148	55	65	30	24	53	93	43	53	1181
(21)AVERAGE	1,27	1,30	1,20	1,25	1,33	1,49	1,35	1,40	1,38	1,45	1,33	1,19	1,26	1,30
(22)STANDARD DEVIATION	7,21	3,49	9,32	8,59	5,43	3,67	4,71	1,83	1,17	4,07	5,56	1,54	3,59	33,31

TABLE C.4.4.a. ELITE 20th ENGLISH ENTREPRENEURS, EDUCATION LEVELS AND ECONOMIC SECTORS
(Nº=102)
ABSTRACT

	(1) NO STUDIES AND UNKNOWN	(2) APPRENTICESHIP AND ARTICLED APPRENTICESHIP	(3) SECONDARY EDUCATION	(4) PUBLIC SCHOOL	(5) UNIVERSITY STUDIES	(6) TOTAL
(1) Agriculture & Food	2	3	3	1	5	14
(2)Automobile & Aeronautics		8	1		7	16
(3)Banking	2	3	2	1	2	10
(4)Commerce	6		2	1	3	12
(5)Communication & Show Business	5	2	5		6	18
(6)Building & Real State		2	3		2	7
(7)Consumer Industries	1	2			7	10
(8)Power			1		2	3
(9)Electric Equipment	1				2	3
(10)Metallurgy & Machine Building		5		1	3	9
(11) Mining					3	3
(12)Chemistry	3	1	2	1	5	12
(13)Insurance			2	1		3
(14)Services	1	2		1	3	7
(15)Iron & Steel		2			1	3
(16)Textiles	2	2			1	5
(17)Transportation	1	3	3	3	2	12
(18)Miscellany			1	0	4	5
(19)SECTORS	24	35	25	10	58	152
(20)ENTREPRENEURS	16	24	14	6	42	102
(21)AVERAGE	1,50	1,46	1,79	1,67	1,38	1,49
(22)STANDARD DEVIATION	1,69	1,80	1,14	0,74	1,88	4,70

TABLE C.4.4.b. ELITE 20th ENGLISH ENTREPRENEURS, EDUCATION LEVELS AND ECONOMIC SECTORS
(Nº=102)

	(1) No studies	(2) Unknown	(9) Apprenticeship	(10) Articled Apprenticeship	(5) Secondary Education	(6) Public School	(7) Engineer/ Architect	(8) Law	(9) Economics	(10) Sciences	(11) Cross-disciplinary and Unknown University Studies	(12) Unfinished University Studies	(13) Miscellany	(14) TOTAL
(1)Agriculture & Food		2	3		3	1			2			2	1	14
(2)Automobile & Aeronautics			3	5	1		4		1			1	1	16
(3)Banking	1	1	2	1	2	1		1				1		10
(4)Commerce	5	1			2	1			1	1			1	12
(5)Communication & Show Business	3	2	2		5				3			2	1	18
(6)Building & Real State			2		3				1			1		7
(7)Consumer Industries	1		1	1			1		2			2	1	10
(8)Power					1		1			1				3
(9)Electric Equipment	1						1					1		3
(10)Metallurgy & Machine Building			2	3		1	2	1						9
(11) Mining							2					1		3
(12)Chemistry	2	1		1	2	1		1	1	2			1	12
(13)Insurance					2	1								3
(14)Services	1			2	1				2			1		7
(15)Iron & Steel			2									1		3
(16)Textiles	2		1	1						1				5
(17)Transportation		1	1	2	3	3	1						1	12
(18)Miscellany					1			1				1	2	5
(19)SECTORS	16	8	19	16	25	10	12	4	13	5	9	9	6	152
(20)ENTREPRENEURS	12	4	14	10	14	6	9	2	9	4	6	7	5	102
(21)AVERAGE	1,33	2,00	1,36	1,60	1,79	1,67	1,33	2,00	1,44	1,25	1,50	1,29	1,20	1,49
(22)STANDARD DEVIATION	1,32	0,47	0,70	1,32	1,14	0,66	1,03	0,00	0,70	0,43	0,45	0,45	0,00	4,70

TABLE C.4.5.a. ELITE 19th ENGLISH ENTREPRENEURS, EDUCATION LEVELS AND ECONOMIC SECTORS
(Nº=100)
ABSTRACT

	(1) NO STUDIES AND UNKNOWN	(2) APPRENTICESHIP AND ARTICLED APPRENTICESHIP	(3) SECONDARY EDUCATION	(4) PUBLIC SCHOOL	(5) UNIVERSITY STUDIES	(6) TOTAL
(1) Agriculture & Food	1	5	1		2	9
(2)Automobile & Aeronautics		2			3	5
(3)Banking		2		2	4	8
(4)Commerce	3	4	3	1	3	14
(5)Communication & Show Business	2		3	1	3	9
(6)Building & Real State	1	1			1	3
(7)Consumer Industries	1	1				2
(8)Power		1			1	2
(9)Electric Equipment		1	1		1	3
(10)Metallurgy & Machine Building	1	8	5	1	6	21
(11) Mining	2	4	1	1	1	9
(12)Chemistry	1	2	2		4	9
(13)Insurance	1					1
(14)Services	4	1			1	6
(15)Iron & Steel	5	2	4		7	18
(16)Textiles	2	5	3	1	1	12
(17)Transportation	1	3	2		3	9
(18)Miscellany					2	2
(19)SECTORS	25	42	25	7	43	142
(20)ENTREPRENEURS	19	37	16	4	24	100
(21)AVERAGE	1,32	1,14	1,56	1,75	1,79	1,42
(22)STANDARD DEVIATION	1,27	1,97	1,28	0,37	1,79	5,51

TABLE C. 4.5.b. ELITE 19th ENGLISH ENTREPRENEURS, EDUCATION LEVELS AND ECONOMIC SECTORS

(Nº=100)

	(1) No studies	(2) Unknown	(11) Apprenticeship	(12) Articled Apprenticeship	(5) Secondary Education	(6) Public School	(7) Engineer/ Architect	(8) Law	(9) Economics	(10) Sciences	(11) Cross-disciplinary and Unknown University Studies	(12) Unfinished University Studies	(13) Miscellany	(14) TOTAL
(1)Agriculture & Food	1		4	1	1		1				1			9
(2)Automobile & Aeronautics			1	1			1			2				5
(3)Banking			2			2					3		1	8
(4)Commerce	1	2	4		3	1				1			2	14
(5)Communication & Show Business		2			3	1				1	2			9
(6)Building & Real State		1		1						1				3
(7)Consumer Industries	1			1										2
(8)Power			1							1				2
(9)Electric Equipment			1		1					1				3
(10)Metallurgy & Machine Building	1		4	4	5	1	2	2		1	1			21
(11) Mining	2		1	3	1	1					1			9
(12)Chemistry	1		2		2					4				9
(13)Insurance	1													1
(14)Services	2	2		1							1			6
(15)Iron & Steel	5		1	1	4		1			3	2		1	18
(16)Textiles	2		5		3	1					1			12
(17)Transportation	1		3		2					2	1			9
(18)Miscellany												2		2
(19)SECTORS	18	7	29	13	25	7	5	2		17	13	2	4	142
(20)ENTREPRENEURS	14	5	26	11	16	4	2	1		7	9	2	3	100
(21)AVERAGE	1,29	1,40	1,12	1,18	1,56	1,75	2,50	2,00		2,43	1,44	1,00	1,33	1,42
(22)STANDARD DEVIATION	1,15	0,43	1,44	1,11	1,28	0,37	0,43	0,00		1,00	0,70	0,00	0,47	5,51

TABLE C.5.1 . EDUCATION OF SPANISH ENTREPRENEURS, SELF-MADE AND THE REST
(percentages)

SELF-MADE				
	(1)All	**(2)Elite**	**(3)Valencian**	**(4)Catalan**
(1) Elem-NotKnow	32,6	14,6	47,5	28,3
(2) University	51,8	70,8	32,2	63,0
REST				
(3) Elem-NotKnow	34,7	32,1	43,6	32,2
(4) University	52,4	58,5	47,3	49,2

TABLE C.5.2. EDUCATION OF ENGLISH ENTREPRENEURS, SELF-MADE AND THE REST
(percentages)

SELF-MADE					
	(1)All	**(2)Not Manager**	**(3)Manager**	**(4)Elite XIX**	**(5)Elite XX**
(1) Elem-NotKnow	24,7	28,9	14,6	24,5	22,0
(2) University	28,4	22,4	42,7	20,8	44,0
REST					
(3) Elem-NotKnow	18,9	20,8	3,6	12,8	9,6
(4) University	33,5	32,2	43,6	27,7	38,5

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