ACCOUNTING AND FINANCE LITERACY AND SELF-EMPLOYMENT: AN EXPLORATORY STUDY

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Abstract

The measurement of financial literacy has gained much attention in the recent past. Recent studies have shown that the level of basic financial literacy in the general population around the world is surprisingly low. In this study we investigate the level of financial literacy in a sample of self-employed entrepreneurs in Spain. In order to do accomplish this task we develop a new set of questions related to the financing and the financial reporting of a business. Our results show that also for this Spanish sample the overall level of basic financial literacy is quite low, even if it is slightly better than the one found in previous studies. We do not find significant differences between the level of financial literacy of entrepreneurs and non-entrepreneurs. However we find that serial successful entrepreneurs understand better diversification and the potential danger of uncontrolled growth. Interestingly, lower levels of accounting and finance literacy are found in mature businesses and operating in the primary sector, i.e. more traditional businesses. We interpret this result as an indication of the fact that the Spanish economy may be experiencing a transition phase from a model based on traditional businesses run on more conservative basis to more modern businesses run with a more sophisticated knowledge of financial concepts.

INTRODUCTION

According the latest Global Findex Database (World Bank, 2015), 94% of the adult population in High Income OECD countries owns a bank account and uses it very often. Even if we restrict our attention to the poorest 40% of the households, the percentage is still at a very high 91%. In Spain the same percentages are, respectively, 98% and 97%. In terms of saving behavior, 73% of the adult population saves somehow, and 52% does it in a formal way. 53% of people own a credit card. Savings is the main source of emergency funds in this group of High Income countries. Hence, the vast majority of the population of developed economies has a stable and important relation with the financial system. However, how well prepared is the population to cope with financial instruments and concepts? Surprisingly this question has not been formally addressed until very recently. The scientific study of financial literacy among the population is very recent and, as we will see, has revealed a surprisingly high level of financial illiteracy around the world.

In Spain, an important part of the working population is self-employed. According to EUROSTAT, in 2014 13.9% of the people employed were self-employed compared to 15.5% for the EU28 group of countries. These people are in charge of their working activity and consequently have to take, either on their own or with external advice, very important financial decisions in order to manage their economic activity. However, we know very little about the level of specific financial literacy of this sub-group of the population.

The purpose of this study is to try to fill this gap, at least for Spain. Starting from the existing methodology used to measure the level of financial literacy for the general population, we will extend it in order to measure the level of more specific accounting and finance literacy for self-employed entrepreneurs. We will apply this methodology to a sample representative of the population of self-employed entrepreneurs in Spain.

The paper is organized as follows. In the next section we will revise the state of the art for the measurement of financial literacy. Afterwards we will present the sample and the methodology used in this study. Then we will present the results of our analysis. Finally we provide some conclusions.

THE MEASUREMENT OF FINANCIAL LITERACY

Despite the growth in the use of financial products in developed countries, until very recently we did not know much about the ability of the population of dealing with these instruments. The importance of being able to evaluate financial alternatives and chose correctly financial products always becomes apparent in the wake of a financial crisis. The recent financial crisis was not an exception. Both the media and the anedoctical evidence are full of stories of people losing all their savings because of bad financial decisions and the purchase of the wrong financial products.

In order to take sensible financial decisions it is necessary to be capable of performing some basic calculations that allows us to compare correctly the alternatives at our disposal[1]. So, it seems very important to be able to measure how this ability is spread among individuals in order to assess how expose is the system to the consequences of wrong financial decisions.

In their pioneering work on the measurement of financial literacy Lusardi and Mitchell (2008, 2011) developed a methodology to measure the level of basic financial literacy. This methodology is based on three simple questions suitable of being included in national surveys of the population.

The first question is as follows[2]

"Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?"

More than $102** Exactly $102 Less than $102 Do not know/Refuse to answer

With this question, we can capture the ability of the individual to perform a very simple compounding of interest.

The second question is as follows

"Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?"

[1] For a survey of the theoretical literature on optimal financial decisions in a life-cycle setting and its relationship to financial literacy, you can look at Lusardi and Mitchell (2014)

[2] These questions have been reproduced in many studies. We have taken the version included in Lusardi and Mitchell (2008)

More than today Exactly the same Less than today Do not know/Refuse to answer

This question allows us to observe the capacity of the individual to include the effect of inflation in his/her financial calculations.

Finally, the third question is as follows

"Please tell me whether this statement is true or false. "Buying a single company's stock usually provides a safer return than a stock mutual fund."

True False Do not know/Refuse to answer

The purpose of this question is to jointly test the level of knowledge of the principle of risk diversification and of the financial product "Mutual Fund".

These three questions were used extensively for the first time in 2004 in the US. They were included in the Health Retirement Study (HRS) which covers individuals of age 50 and older. It turned out that only 34.3% of the older were able to answer all the three questions correctly and 9.9% of the respondents answered incorrectly to all questions.

Since then, these three questions have been used in nationwide surveys around the world. A total of 13 papers have been published using national surveys that included that question. We will look at the results of these studies later when we will examine the results of our survey.

The literature on financial literacy has then started to investigate more specific aspects of financial literacy. This has been done by inserting additional questions aimed at capturing other aspects of the financial knowledge of the persons being studied.

In the US, in the 2009 first wave of the National Financial Capability Survey, two additional financial literacy questions were added, dealing with bond pricing and mortgage repayments calculations. A description of the result can be found in Lusardi (2011). With the addition of these two questions, the percentage of people answering all the five questions correctly drops to 10%, despite the fact that 70% of the respondent get the correct answer in the mortgage related question. The bond pricing question appears to be particularly challenging with only 20% of the subjects picking the right answer.

Lusardi and Tufano (2015) designed 3 new questions questions to measure "debt literacy" in the US. These questions are more sophisticated than the basic three questions used in previous studies. They find that only around 35% of the subjects had a correct intuitive

understanding of revolving credit card debt and only 6.9% could correctly figure out the cheapest financing alternative among two possible repayment plans.

In the 2008 round of the HRS survey, 1,000 older subjects were asked to answer ten additional questions aiming at measuring financial sophistication regarding knowledge of financial markets, risk diversification, knowledge of fees and numeracy. The analysis of these data performed by Lusardi, Mitchell and Curto (2013) shows a substantial lack of financial sophistication.

Van Rooij, Lusardi and Alessie (2011) extend the analysis of basic financial literacy in the Netherlands with a section about financial literacy among people participating in the stock market. They add 13 questions concerning various concepts related to stocks and risk diversification, and they divide the total of 16 questions into two categories: *basic* financial literacy (5 questions) and *A&F* literacy (11 questions). A&F literacy resulted much lower than basic financial literacy. 40.2% of the sample was able to answer all the basic financial literacy questions right, but only 5% could answer all the advanced questions right.

In our study will use a similar approach to Van Rooij, Lusardi and Alessie (2011) and we will use a set of eight questions divided into 3 *basic* questions and 5 *advanced* questions. The advanced questions will be devoted to topics regarding the financing and the financial reporting of a business.

In a related study, Davila and Foster (2005) have studied the effect of the adoption of formal management control systems on the success of entrepreneurial projects. They find that this relationship is positive, i.e. the adoption of a formal system of internal reporting has a positive effect on the probability of success. If we assume that an advanced level of financial literacy is needed to organize and use a formal management control system, then this result support the conjecture that A&F literacy is a key factor for successful entrepreneurial projects. In order to test this conjecture, in this study we have developed a set of A&F literacy question with the aim of capturing the level of financial literacy of self-employed entrepreneurs.

EMPIRICAL ANALYSIS

Sample

Our sample is made of 400 self-employed individuals. The sample is representative of the geographical distribution of self-employed people in Spain. We also have 100 individuals who are not entrepreneurs. We will use these individuals as a control to check if we detect major differences between entrepreneurs and non-entrepreneurs in terms of financial literacy. An international company specialized in collecting data for economic and market research was in charge of the selection of the sample and the collection of the data. The questionnaire was prepared by the author and tested with an initial sample of self-employed individual selected with the help of Baquia, a Spanish web portal for entrepreneurs[3].

Table 1 presents the composition of the whole sample in terms of gender, age, education and self-reported level of financial literacy. The sample of respondents is predominantly made of males, of people in between 35 and 54 years of age, with at least some vocational or high school education and that believes to have some medium level of financial literacy.

Table 1 Composition of the whole sample

	Entrepreneur		
	Yes	No	Total
Gender			
Male	68.80%	64.00%	67.80%
Female	31.30%	36.00%	32.20%
Respondent Age			
25_34	18.50%	29.00%	20.60%
35_44	40.00%	35.00%	39.00%
45_54	31.30%	25.00%	30.00%
55_64	10.30%	11.00%	10.40%
Education			
Primary	2.80%	1.00%	2.40%
Secondary	4.80%	8.00%	5.40%
Vocational	18.30%	15.00%	17.60%
High School	17.80%	12.00%	16.60%
Some College	13.50%	16.00%	14.00%
College degree	28.00%	34.00%	29.20%
Post-graduate	14.50%	14.00%	14.40%
Other	0.50%	0.00%	0.40%
Fin Lit Level (self reported)			
1 (lowest)	5.30%	4.00%	5.00%

[3] www.baquia.com

2	12.00%	12.00%	12.00%
3	20.00%	23.00%	20.60%
4	22.00%	20.00%	21.60%
5	27.80%	33.00%	28.80%
6	10.80%	5.00%	9.60%
7 (highest)	2.30%	3.00%	2.40%
n	400	100	500

In Table 2 we can see some of the characteristics of the main sample of self-employed entrepreneurs. For the vast majority of them, their actual business venture is also their first. Of those that had previous experiences as entrepreneurs, almost 81% were successful in at least one of them. A big part (55%) of the business involved in the survey had been running for more than 5 years and the vast majority of them were small or micro enterprises (less than 9 employees and/or less than 2 million euros of sales per year.).

Table 2 Additional features of the sample of self-employed entrepreneurs

First Venture	
Yes	62.00%
No	38.00%
Previous Success (only for serial entrepreneurs)	
Yes	80.90%
No	19.10%
Business Age	
Less than 1 yr	11.00%
Between 1 and 3 yrs	22.80%
Between 3 and 5 yrs	11.30%
More than 5 yrs	55.00%
Employees	
0-9	95.20%
10-49	3.70%
50-249	0.80%
250+	0.30%
n	400
Yearly sales	
< € 2.000.000	68.00%
> € 2.000.000 and <€ 5.700.000	2.50%
> € 5.700.000	0.80%
No answer	28.70%

Data collection and Methodology

In January 2015, these individuals were contacted by representatives of the data collection company and asked to answer a survey that contained 8 questions related to financial literacy. The first 3 financial literacy questions were the standard questions already used in all the previous studies on financial literacy conducted around the world. We will call these the "Basic" financial literacy questions.

The following 5 questions were newly created for this study and aimed at measuring the level of accounting and finance literacy. For simplicity we will call them the "A&F" literacy question. The topics of these 5 questions were:

- Perception of debt as a financing tool
- Evaluation of growth opportunities
- Cash vs Accrual financial performance measurement
- Depreciation
- Economic vs Financial profitability

We have already described the basic financial literacy questions in a previous section. Now we will proceed to describe the advanced financial literacy questions created on purpose for this study.

The first question was as follows

"To have no debt is always a desirable situation for a company"

True False I don't know No answer

The purpose of this question is to check the perception of debt that entrepreneurs have. If the answer chosen is "True", we interpret this as an aversion to debt as a way of financing your business. The determination of the optimal level of debt is one of the key issues in the theory of corporate finance. Notwithstanding the difficulties in determining a precise value for the optimal level of debt, it is very rarely the case that it is exactly 0. So the answer "True" detects an intuitive and highly conservative way to approach the search for sources of finance for the business. The best answer here should be "False".

The second advanced question was as follows

"If sales are growing, this means that the business is healthy"

True False I don't know No answer

The purpose of this question is to check the capacity of managing the growth of the business. Sales growth is not enough as an indicator of sound performance. A business that is growing may not be profitable and may end up in bankruptcy. The answer "True" detects a naïve and possibly dangerous approach to business evaluation. Again, the best answer here should be "False".[4]

The third advanced question was as follows

"If at the end of a certain period (day, month, year,…) a business has more cash than at the beginning of the period, this means that the business has made a positive profit"

True False I don't know No answer

The purpose of this question is to check the ability to distinguish cash flow from the accrual based calculation of profit. The use of the accrual principle is a fundamental characteristic of modern financial accounting. Again the answer "True" detects a rudimental approach to the calculation of business financial and economic performance that does not take into account that importance of allocating revenues and expenses to the correct period from an economic point of view.

The fourth advanced question was as follows

"A business has just bought a piece of equipment that has cost €200. This equipment is going to be used for 5 years. The profit of the current year will be reduced by:"

More than €200 Less than €200 Exactly €200 I don't know No answer

This question is strictly related to the previous question, given that it is also related to the difference between cash flow and accrual accounting. However it focuses more specifically on the correct evaluation of an investment from an economic point of view, while drawing up the accounts at the end of the year. Any answer other than "Less than €200" detects an intuitive

[4] Or at least "I don't know", "No answer".

approach that could be detrimental for the correct evaluation of growth generating investments.

The final advanced question was as follows

"The return on assets is called ROA and the return on equity inverted into the business by shareholders is called ROE. In general, the level of debt is more sustainable if:"

ROA > ROE ROA < ROE ROA = ROE I don't know No answer

This question is clearly more complicated that the previous ones. Its purpose is to see if the entrepreneur has some knowledge of the so called "leverage effect", i.e. the capacity of debt to increase the return for the owners. The "leverage effect" is positive when "ROA < ROE". In this case the cost of debt is lower than the economic profitability of the company and this means that debt is more sustainable. Moreover this question also tests the familiarity that the respondent has with the concepts of ROA and ROE. The ability to answer this question correctly allows us to detect very high levels of financial knowledge.

RESULTS

Basic Financial Literacy

In Table 3 we find the results of our survey for the three basic financial literacy questions compared with the results obtained in other countries.

In our Spanish sample, 44.8% of the respondents got all the three questions right. This is a fairly high proportion compared with other countries. Only in Germany and in Switzerland the proportion was higher. We need to stress that our sample is mainly made of entrepreneurs, whereas the other samples are representative of the general population. However in Table 4 we provide the breakdown of self-employed versus employees in our sample and in some of the available international studies. Again the level of basic financial literacy in our sample is relatively high.

Table 3 Basic Financial literacy & International comparisons

Authors	Country	Year of data	Interest rate		Inflation		Risk Diversification		All 3 correct	At least 1 Don't Know	Obs.
			Correct	DK	Correct	DK	Correct	DK			
Trombetta (2015)	**Spain**	**2015**	**85.2%**	**8.0%**	**70.0%**	**20.2%**	**56.2%**	**37%**	**44.8%**	**22.4%**	**500**
Lusardi and Mitchell (2011d)	USA	2009	64.9%	13.5%	64.3%	14.2%	51.8%	33.7%	30.2%	42.4%	1.488
Alessie, VanRooij, and Lusardi (2011)	Netherlands	2010	84.8%	8.9%	76.9%	13.5%	51.9%	33.2%	44.8%	37.6%	1.665
Bucher-Koenen and Lusardi (2011)	Germany	2009	82.4%	11.0%	78.4%	17.0%	61.8%	32.3%	53.2%	37.0%	1.059
Sekita (2011)	Japan	2010	70.5%	12.5%	58.8%	28.6%	39.5%	56.1%	27.0%	61.5%	5.268
Agnew, Bateman, and Thorp (2013)	Australia	2012	83.1%	6.4%	69.3%	13.0%	54.7%	37.6%	42.7%	41.3%	1.024
Crossan, Feslier, and Hurnard (2011)	N. Zealand	2009	86.0%	4.0%	81.0%	5.0%	27.0%	2.0%*	24.0%*	7.0%	850
Brown and Graf (2013)	Switzerland	2011	79.3%	2.8%*	78.4%	4.2%*	73.5%*	13.0%*	50.1%*	16.9%*	1.500
Fornero and Monticone (2011)	Italy	2007	40.0%*	28.2%*	59.3%*	30.7%*	52.2%*	33.7%*	24.9%*	44.9%*	3.992
Almenberg and Säve-Söderbergh (2011)	Sweden	2010	35.2%*	15.6%*	59.5%	16.5%	68.4%	18.4%	21.4%*	34.7%*	1.302
Arrondel, Debbich, and Savignac (2013)	France	2011	48.0%*	11.5%*	61.2%	21.3%	66.8%*	14.6*	30.9%*	33.4%*	3.616
Klapper and Panos (2011)	Russia	2009	36.3%*	32.9%*	50.8%*	26.1%*	12.8%*	35.4%*	3.7%*	53.7%*	1.366
Beckmann (2013)	Romania	2011	41.3%	34.4%	31.8%*	40.4%*	14.7%	63.5%	3.8%*	75.5%*	1.030

Note: * indicates questions that have slightly different wording than the baseline financial literacy questions enumerated in the text.
Source: Lusardi & Mitchell (2014) Table 2 and data from this study

Table 4. % of respondents that get all the 3 basic questions right.

Country	Self-employed (%)	Employees (%)
Spain	**46.0**	**40.0**
EEUU	36.8	36.3
The Netherlands	50.15	28.3
Italy	28.92	28.74
Germany	66.8	62.1
Sweden	32.8	24.1
Russia	0	3.27
Japón	24.1	27.7

Fuente: Journal of Pension Economics & Finance, 2011 and data from this study

In all the studies conducted so far around the world, females score worst than males at answering the three basic questions. In Table 5 we find the result of this study compared with some of the international evidence. Also in Spain female respondents perform clearly worst than male respondents. Only for the USA we find a lower percentage of correct answers for females.

Table 5. Basic Financial Literacy and Gender

% of respondents that get all the 3 basic questions right

	Male	Female
Spain	**53,40%**	**26,70%**
USA	38.3%	22.5%
Germany	59.6%	47.5%
Netherlands	55.1%	35.0%
Switzerland	62.0%	39.3%

Source: Lusardi & Mitchell (2014) and data from this study

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In Table 6 we can see the results according to the age of the respondent both of this study and of some international studies. Even if the age brackets used in our study do not exactly coincide with those used in other studies, we can still notice that the situation in our sample is similar to the USA where basic financial literacy is increasing in age, at least until the age of 65. In all the other countries, basic financial literacy peaks in between 35 and 60 and decreases afterwards.

Table 6. Respondent's age

% of respondents that get all the 3 basic questions right

	25_34	35_54	55_64
Spain	**37,90%**	**43,48%**	**67,30%**
	<36	36-50	51-65
USA	19.5%	37%	40%
Germany	55%	61%	52%
Netherlands	46%	46%	47%
Switzerland	45%	52%	49%

Source: Lusardi & Mitchell (2014) and data from this study

Finally in Table 7 we find the level of basic financial literacy by educational level. The direct comparison with international studies is not possible because of the different educations systems. However, we observe in our results a common phenomenon already observed in the previous literature: the level of basic financial literacy is increasing in the level of formal education obtained.

Table 7 Educational levels

% of respondents that get all the 3 basic questions right

Education	
Primary	33,30%
Secondary	29,60%
Vocational	31,80%
Bachallaureate	39,80%
College (Diploma)	47,10%
University Degree	52,10%
Postgraduate	56,90%

To summarize the level of basic financial literacy in our Spanish sample dominated by self-employed people is relatively high with respect to the level reported by other studies conducted in other countries on samples of the general population. Its general distribution by employment status, gender and education is in line with what has been found before. With respect to respondent's age we observe an increasing relationship, which makes our sample different from other European samples where an inverse U relationship was found.

A&F LITERACY

Basic vs A&F literacy

We now move to the analysis of the answers to the newly created questions on A&F literacy for entrepreneurs. It is impossible to run an international comparison of these results because these questions have been used in this form for the first time in this study.

In Table 8 and 9 we find the summary of the answers given to the A&F literacy questions compared to those given to the basic financial literacy questions.

Table 8 Basic vs A&F Literacy – General

	All answers correct	
	No	Yes
Basic	55.20%	44.80%
A&F	98.60%***	1.40%***
A&F without ROA vs ROE	86.2%***	13.8%***

	All answers wrong or no answer	
Basic	91.00%	9.00%
A&F	76.60%***	23.40%***
A&F without ROA vs ROE	90.0%	10.0%

n = 500 (Whole sample)

***= the difference between Basic and Advanced is significant at 1% level

Table 9 Basic vs A&F Literacy – Breakdown of the answers

	Correct/Best	Others	DK/NA
Basic			
Simple compounding	85.2%***	6.8%	8.0%
Inflation	70.0%***	9.8%	20.2%
Diversification	56.2%***	6.8%	37.0%
A&F			
Debt	29.0%***	63.2%	7.8%
Sales	48.8%***	42.6%	8.6%
Accrual	43.0%***	47.2%	9.8%
Depreciation	52.4%***	27.0%	20.6%
ROA vs ROE	8.8%***	23.4%	67.8%

n = 500 (Whole sample)

***= this % is significantly bigger than the % of "all right" answers at the 1% level

On a general level it is manifest that the level of A&F literacy is much lower that the level of basic financial literacy. Only 1.40% (23.40%) of the subjects got all the advanced questions right (all wrong or no answer), compared to 44.80% (9.0%) for the basic questions. In the Dutch sample used by Van Rooij et. al. (2011) at least 5.0% the respondents got all the A&F literacy questions right and only 3.6% got all of them either wrong or with no answer.

In Table 9 we find the breakdown of the results for each question. The performance varies substantially among the questions. The questions that hints at the difference between financial profitability and economic profitability and their relation to the cost of debt is by far the most difficult to answer. Only 8.8% of the subjects got the right answer and 67.8% could not pick an answer[5]. Given that these percentages are very different compared to the others, we have recalculated the level of A&F literacy without including the last question on ROA and ROE. The results can be found in Table 8. If we exclude the most difficult question, the level of A&F literacy increases, but it is still substantially lower than the basic in terms of getting all the questions right (13.8% for advanced vs 44.80% for basic) but it is comparable in terms of getting all the questions wrong (10.0% for advanced vs 9.0% for basic). This means that the

[5] It is interesting that the second worst question in terms of percentage of correct answers is the question about the optimal level of debt, which is obviously related to the question about ROA and ROE.

level of complete ignorance in this case is virtually the same no matter which type of financial literacy we focus on.

Entrepreneurs vs Non entrepreneurs

Let us now compare the level of A&F literacy between entrepreneurs and non- entrepreneurs.

In Table 10 we find the comparison in terms of the overall level of financial literacy.

Table 10 A&F literacy

Entrepreneurs vs Non entrpreneurs - General

	Entrepreneurs	Yes	No
Basic all right	Yes	46.0%	54.0%
	No	40.0%	60.0%
Basic all wrong	Yes	9.30%	90.8%
	No	8.0%	92.0%
Advanced all right	Yes	1,3%	98,8%
	No	2,0%	98,0%
Advanced all wrong	Yes	23,0%	77,0%
	No	25,0%	75,0%
Advanced all right exc. ROA vs ROE	Yes	13,5%	86,5%
	No	15,0%	85,0%
Advanced all wrong exc. ROA vs ROE	Yes	9,5%	90,5%
	No	12,0%	88,0%

In terms of basic financial literacy, we had already noticed that entrepreneurs seem to be more financial literate than non-entrepreneurs. When we look at A&F literacy, the picture is different. Even if the differences are not very big, it is interesting to notice that, in our sample, non-entrepreneurs seem to score slightly better than entrepreneur. This result gives support to the idea that A&F literacy is not a key factor in determining the employment status of the respondents. Entrepreneurs do not seem to know better some key concepts of financial management than non-entrepreneurs. This is confirmed by the fact that the differences between entrepreneurs and non-entrepreneurs are never statistically significant.

In Table 11 we find the breakdown for each of the 8 questions regarding financial literacy.

Table 11 Financial literacy – Entrepreneurs vs Non entrepreneurs - Breakdown

Question	*Entrepreneurs*	Right	Wrong	DK/NA
Interest	Yes	84,3%	7,6%	8,3%
	No	89,0%	4,0%	7,0%
Inflation	Yes	71,0%	9,3%	19,8%
	No	66,0%	12,0%	22,0%
Diversification	Yes	57,3%	6,5%	36,3%
	No	52,0%	8,0%	40,0%
Debt	Yes	27,8%	64,8%	7,5%
	No	34,0%	57,0%	9,0%
Sales	Yes	49,5%	41,5%	9,1%
	No	46,0%	47,0%	7,0%
Accrual	Yes	43,3%	47,0%	9,8%
	No	42,0%	48,0%	10,0%
Depreciation	Yes	53,3%	26,6%	20,3%
	No	49,0%	29,0%	22,0%
ROA vs ROE	Yes	8,0%	22,8%	69,3%
	No	12,0%	26,0%	62,0%

In 5 out of the 8 questions entrepreneurs score a higher percentage of correct answers than non-entrepreneurs. However in 1 of the basic questions (Interest compounding) and in 2 of the advanced questions (Debt and ROA vs ROE) non-entrepreneurs score better. Again, none of these differences is statistically significant.

Hence the first conclusions that we can draw from our empirical analysis is that entrepreneurs do not appear to be particularly good at evaluating, for example, the potential of debt as a way of financing the business, or at distinguishing positive cash flow from “profit”. In other words

A&F literacy does not seem a key factor in distinguishing entrepreneurs from non-entrepreneurs.

Differences among entrepreneurs

We now shift our attention to potential differences in financial literacy related to some of the characteristics of the business. Hence, we now focus on those respondents that are self-employed and we do not consider non-entrepreneurs.

In Table 12 we observe the level of basic and A&F literacy grouped by the age of the business.

In terms of the percentage of basic and A&F questions all correctly answered, the best performers are always companies that have in between 1 and 5 years of age. On the contrary, the highest percentage of questions all wrong or not answered is found either for the youngest companies (less than 1 year of age) or for the oldest companies (more than 5 years of age).

Of particular interest is the analysis of the case of older companies (more than 5 years). If we exclude the questions about ROA and ROE, for both “all basic answers correct” and for “all advanced answers correct” their percentage is clearly the lowest. These companies also tend to register a relatively high percentage of “all wrong” answers.

However these differences are statistically significant only in two cases. Hence the general conclusion is that the age of the business is not a differentiating factor with respect to the level of financial literacy.

Table 12 Financial literacy by business age

	Business Age	No	Yes
All traditional answers correct	Less than 1 yr	52,30%	47,70%
	Between 1 and 3 yrs	53,80%	46,20%
	Between 3 and 5 yrs	48,90%	51,10%
	More than 5 yrs	55,50%	44,50%
All traditional answers wrong	Less than 1 yr	88,60%	11,40%
	Between 1 and 3 yrs	91,20%	8,80%
	Between 3 and 5 yrs	91,10%	8,90%
	More than 5 yrs	90,90%	9,10%
All advanced answers correct	Less than 1 yr	100,00%	0,00%
	Between 1 and 3 yrs	97,80%	2,20%
	Between 3 and 5 yrs	100,00%	0,00%
	More than 5 yrs	98,60%	1,40%
All advanced answers wrong	Less than 1 yr	72,70%	27,30%
	Between 1 and 3 yrs	82,40%	17,60%
	Between 3 and 5 yrs	75,60%	24,40%
	More than 5 yrs	75,90%	24,10%
All advanced correct exc. ROA vs ROE	Less than 1 yr	81,80%	18,20%
	Between 1 and 3 yrs	80,20%	19,80%**
	Between 3 and 5 yrs	86,70%	13,30%
	More than 5 yrs	90,00%	10,00%**
All advanced wrong exc. ROA vs ROE	Less than 1 yr	93,20%	6,80%
	Between 1 and 3 yrs	90,10%	9,90%
	Between 3 and 5 yrs	93,30%	6,70%
	More than 5 yrs	89,50%	10,50%

**= % significantly different than the whole sample at the 5% level

In Table 13 we have divided the observations according to the macro sector of activity of the company[6].

Table 13 Financial literacy by macro sector of activity

		No	Yes
All traditional answers correct	Primary	85.7%	14.3%*
	Secondary	49.1%	50.9%
	Tertiary	54.5%	45.5%
All traditional answers wrong	Primary	100.0%	0.0%
	Secondary	94.7%	5.3%
	Tertiary	90.1%	9.9%
All advanced answers correct	Primary	100.0%	0.0%
	Secondary	98.2%	1.8%
	Tertiary	98.6%	1.4%
All advanced answers wrong	Primary	71.4%	28.6%
	Secondary	80.7%	19.3%
	Tertiary	77.1%	22.9%
All advanced correct exc. ROA vs ROE	Primary	100.0%	0.0%
	Secondary	91.2%	8.8%
	Tertiary	86.0%	14.0%
All advanced wrong exc. ROA vs ROE	Primary	85.7%	14.3%
	Secondary	87.7%	12.3%
	Tertiary	90.8%	9.2%

*= % significantly different than the whole sample at the 10% level

We can see that the secondary sector is characterized by a higher level of basic financial literacy. However, if we exclude the question about ROA and ROE, A&F literacy is higher in the tertiary sector. However these differences are statistically significant only with respect to the primary sector, whose level of basic financial literacy is substantially lower than the rest of the sample.

An issue highly debated in the literature is whether serial entrepreneurs are more likely to succeed than first-time entrepreneurs are[7]. Our data allows us to segment the analysis of financial literacy by this variable. We find this analysis in Table 14.

[6] Given the small number of observations, it is impossible to conduct a meaningful analysis with a finer definition of sectors.

[7] Gompers et al. (2010), for example, find evidence that this is the case for a sample of US entrepreneurs that have received venture capital financing.

Tab. 14 Serial entrepreneurs vs first-time entrepreneurs

	First Venture	No	Yes
All traditional answers correct	Yes	57.30%	42.70%
	No	48.70%	51.30%**
All traditional answers wrong	Yes	90.70%	9.30%
	No	90.80%	9.20%
All advanced answers correct	Yes	98.40%	1.60%
	No	99.30%	0.70%
All advanced answers wrong	Yes	77.00%	23.00%
	No	77.00%	23.00%
All advanced correct exc. ROA vs ROE	Yes	86.70%	13.30%
	No	86.20%	13.80%
All advanced wrong exc. ROA vs ROE	Yes	90.30%	9.70%
	No	90.80%	9.20%

**= % of serial entrepreneur higher than first-time entrepreneurs at the 5% level

Serial entrepreneurs have a significantly higher level of basic financial literacy because a significantly higher proportion of them gets all the three basic financial literacy questions right. This difference is mainly determined by a superior perception of the advantage of diversification in terms of risk management[8]. However, when we move to A&F literacy, we do not see any relevant difference between first-time and serial entrepreneurs. Hence, it is interesting that the propensity of starting more than one business is somehow related to a better grasp of the need to diversify your portfolio in order to diminish your exposure to risk.

Overall our evidence seem to suggest that financial literacy is highest for entrepreneurs in the consolidation period and that have already passed the initial phase. Basic financial literacy appears to be higher for serial entrepreneurs. A&F literacy is generally low, but it is higher for entrepreneurs in the consolidation phase.

[8] For this question, the percentage of serial entrepreneurs that choose the right answer (61.8%) is significantly higher than the rest of the population (54.8%)

Analysis of specific questions

The main innovation of this study with respect to previous studies on financial literacy is the use of 5 new "A&F" questions specifically designed for a sample of entrepreneurs. For this reason, we now move to the analysis of the answers to each one of these 5 questions.

In Table 15 we find the answer to the question related to the perception of Debt as a way to finance the business.

Tab. 15 Perception of Debt as a way to finance the business

Entrepreneur	TRUE	FALSE	DK/NA
Yes	64.80%*	27.80%	7.50%
No	57.00%	34.00%	9.00%
First Venture			
Yes	65.30%	27.00%	7.70%
No	63.80%	28.90%	7.20%
Success			
Yes	66.70%*	25.20%**	8.20%
No	51.70%	44.80%	3.40%
Business Age (yrs)			
Less than 1	59.10%	34.10%	6.80%
Between 1 and 3	57.10%	37.40%	5.50%
Between 3 and 5	51.10%	35.60%	13.30%
More than 5	71.80%***	20.90%	7.30%
Sector			
Primary	85.70%	14.30%	0.00%
Secondary	70.20%	24.60%	5.30%
tertiary	64.00%	27.70%	8.20%

*= % significantly different than the alternative at the 10% level

**= % significantly different than the alternative at the 5% level

***= % significantly different than the alternative at the 1% level

As we clarified before, a "True" answer indicates an intuitive aversion to debt perceived as a dangerous way to finance the business that, if possible, should be avoided. From a corporate finance point of view the most correct answer should be "False". By looking at the table we can see that:

- Entrepreneurs are more “debt averse” than non-entrepreneurs. Almost 65% of the entrepreneurs see a situation with no debt as a desirable situation. This is particularly true for entrepreneurs that have experienced some success in a previous venture.
- “Debt aversion” is more concentrated in mature businesses.

Table 16 refers to the question about opportunities to grow the sales of the business.

Table 16 Perception of Sales growth

Entrepreneur	TRUE	FALSE	DK/NA
Yes	41.50%	49.50%	9.10%
No	47.00%	46.00%	7.00%
First Venture			
Yes	43.10%	48.80%	8.00%
No	38.80%	50.70%	10.50%
Success			
Yes	37.40%	52.80%	9.80%
No	44.80%	41.40%	13.80%
Business Age (yrs)			
Less than 1	36.40%	54.50%	9.10%
Between 1 and 3	40.70%	50.50%	8.80%
Between 3 and 5	22.20%	62.20%	15.50%
More than 5	46.80%**	45.50%*	7.70%
Sector			
Primary	71.40%*	28.60%	0.00%
Secondary	35.10%	52.60%	12.30%
tertiary	42.80%	48.60%	8.50%

*= % significantly different than the alternative at the 10% level

**= % significantly different than the alternative at the 5% level

A “True” answer indicates an unconditional belief that growth is always good no matter what. Again, the most correct answer from a more sophisticated financial point of view is “False”. We observe that:

- Growth is seen as an unconditional ingredient for success more frequently by mature businesses and in the primary sector.

An important feature of sophisticated financial management is the use of an accrual based reporting system and not just a cash based accounting system. Table 17 provides the results for the question related to this issue.

Table 17 Cash vs Accrual based financial performance measurement

Entrepreneur	TRUE	FALSE	DK/NA
Yes	47.00%	43.30%	9.80%
No	48.00%	42.00%	10.00%
First Venture			
Yes	48.40%	43.10%	8.40%
No	44.70%	43.40%	11.80%
Success			
Yes	41.50%**	45.50%	13.00%
No	58.60%	34.50%	6.90%
Business Age (yrs)			
Less than 1	47.70%	43.20%	9.00%
Between 1 and 3	45.10%	47.30%	7.70%
Between 3 and 5	40.00%	46.70%	13.30%
More than 5	49.10%	40.90%	10.00%
Sector			
Primary	85.70%**	14.30%*	0.00%
Secondary	50.90%	43.90%	5.30%
Tertiary	45.20%	43.80%	11.00%

*= % significantly different than the rest of the sample at the 10% level

**= % significantly different than the rest of the sample at the 5% level

A “True” answer underscores a cash based approach in evaluating financial performance, whereas an accrual based approach should be reflected in a “False” answer. We observe that:

- Overall, the difference between entrepreneurs and non-entrepreneurs are very small and non-significative. However, previously unsuccessful entrepreneurs show a more cash based approach.
- The cash orientation is more present in the primary sector.

Depreciation is the most important accrual based adjustment in a financial reporting system. For this reason, it was decided to dedicate one specific question to this issue. A misperception of the accounting for long-term tangible investments may lead to underinvestment or to a delay in investment. In this case the correct answer is “Less than 200”. Table 18 provides the results.

Table 18 Depreciation

Entrepreneur	More than 200	Less than 200	Exactly 200	DK/NA	Incorrect
Yes	5.30%	53.30%	21.30%	20.30%	26.60%
No	5.00%	49.00%	24.00%	22.00%	29.00%
First Venture					
Yes	5.20%	51.60%	22.20%	20.90%	27.40%
No	5.30%	55.90%	19.70%	19.10%	25.00%
Success					
Yes	5.70%	55.30%	21.10%	17.90%	26.80%
No	3.40%	58.60%	13.80%	24.10%	17.20%
Business Age (yrs)					
Less than 1	2.30%	56.80%	18.20%	22.70%	20.50%
Between 1 and 3	7.70%	53.80%	22.00%	16.50%	29.70%
Between 3 and 5	0.00%	60.00%	20.00%	20.00%	20.00%
More than 5	5.90%	50.90%	21.80%	21.40%	27.70%
Sector					
Primary	0.00%	57.10%	14.30%	28.60%	14.30%
Secondary	8.80%	54.40%	24.60%	12.30%	33.40%
Tertiary	5.10%	52.40%	21.20%	21.30%	26.30%

We observe that:

- More than 20% of the respondents account for long-term investment intuitively on a cash flow basis, i.e. they answer “Exactly 200”
- More than 20% either do not know or they do not answer

Finally, we analyze the answers to the question regarding the relationship between debt financing and economic and financial profitability. This was, by far, the most difficult question to understand and to answer. This is reflected in the very low level of correct answers recorded. The results can be found in table 19.

Table 19 Debt financing, economic and financial profitability

Entrepreneur	ROA > ROE	ROA < ROE	ROA = ROE	DK/NA	Incorrect
Yes	14.80%	8.00%	6.00%	71.30%	20.80%
No	20.00%	12.00%	4.00%	64.00%	24.00%
First Venture					
Yes	12.50%	7.70%	3.60%	76.20%***	16.10%***
No	18.40%	8.60%	9.90%	63.10%	28.30%
Success					
Yes	17.90%	7.30%	8.90%	65.90%	26.80%
No	20.70%	13.80%	13.80%	51.70%	34.50%
Business Age (yrs)					
Less than 1	20.50%	0.00%	4.50%	75.00%	25.00%
Between 1 and 3	18.70%	13.20%	5.50%	62.60%	24.20%
Between 3 and 5	20.00%	6.70%	4.40%	68.90%	24.40%
More than 5	10.90%	7.70%	6.80%	74.60%	17.70%
Sector					
Primary	28.60%	0.00%	0.00%	71.40%	28.60%
Secondary	15.80%	10.50%	1.80%	71.90%	17.60%
Tertiary	13.40%	8.90%	7.20%	70.60%	20.60%

***= % significantly different than the alternative at the 1% level

We observe:

- First-time entrepreneurs are those registering the highest level of indecision when faced with this question. In more than 75% of the cases they either do not know or do not answer.
- More than 30% of unsuccessful serial entrepreneurs answer incorrectly.
- In the primary sector no respondent chose the right answer.

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SYNTHESIS AND CONCLUSIONS

The level of basic financial literacy in the Spanish sample analyzed here is relatively higher with respect to the level recorded in similar studies around the world. Both the comparison between entrepreneurs and non-entrepreneurs within our sample and the comparison between our sample and previous studies, show that entrepreneurs seem to have a slightly higher level of basic financial literacy, especially if they have already had a previous entrepreneurial venture. However, they do not have a higher level of A&F literacy. Generally speaking, financial literacy does not seem to be a distinguishing characteristics of entrepreneurs.

Spanish self-employed entrepreneurs tend to have a conservative view of debt as a way of financing the business. This is even more pronounced for older businesses (more than 5 years running) and the primary sector. These mature and traditional businesses are also more cash oriented in their measurement of financial performance.

The highest level of A&F literacy is found in younger businesses moving from the start-up phase to maturity (between 1 and 3 years running) run by people that have had previous ventures with some success. However even this category of entrepreneurs is characterized by a high level of debt aversion.

Based on these results, we can conclude that, in Spain, micro and small entrepreneurs tend to be debt averse and would like to reduce their level of debt to zero. This observation should be registered in conjunction with the fact that it exists a general difficulty in distinguishing economic and financial profitability (ROA and ROE) that obviously coincide if the level of debt is zero.

There exists also a widespread tendency to measure financial performance on a cash basis, even if this is less pronounced than debt aversion. This is not totally surprising, given the importance of correct short-term cash management for the survival of companies, especially if they are relatively small and they may experience difficulties at having access to emergency short-term financing if needed.

Our data does not allow us to distinguish what could be the cause of this conservative vision of the financial management. More than half of the respondents get at least one of the three basic questions wrong. This low level of basic financial literacy is still surprisingly and it shows a

clear lack of basic knowledge. It also shows that a high level of basic financial literacy is not a pre-requisite to become an entrepreneur. In interpreting this result, we do not have to forget that we do not know the reason why these individuals have decided to run their own business instead working as employees. According to the 2013 GEM report for Spain, 18.8% of the Spanish entrepreneurs have started their business out of necessity and not because they felt that there was an unexploited business opportunity. The percentage of these "reluctant" entrepreneurs has been growing in Spain since 2010 because of the bad conditions in the labor market. This phenomenon may have an impact on our results on the level of financial literacy because it is possible that the level of financial literacy of entrepreneurs out of necessity is lower that the level of financial literacy of motivated entrepreneurs.

The interpretation of the results regarding the A&F literacy questions is more complex. The financial concepts behind these five questions are more complex and somehow open to interpretation, despite our effort in making the questions as clear cut as possible. However, our results draw a picture of a low level of sophistication in the financial management skills of these entrepreneurs. The aversion to debt as a source of financing and the cash approach in measuring financial performance are clear. Again, it is difficult to distinguish clearly the reason behind these answers. It could certainly be due to the particular economic cycle experienced in the recent past by these entrepreneurs, characterized by a widespread economic crisis and difficulties in servicing and repaying pre-existing debt. However, it is a fact that these attitudes may have a profound influence on the ability of these enterprises to grow and act as an engine for the growth of the Spanish economy. In other words, the fact that these results can be due to what has been experienced during the recent financial and economic crisis and not to an intrinsic low level of financial knowledge, does not make them less worrying. They show a need for initiatives of financial education that can help at establishing or re-establishing a more fruitful relationship between entrepreneurs and the financial sector, in particular the banking sector, which is the main source of external financing for these enterprises. The recent public debate has often indicated entrepreneurship as a key factor in the recovery from the economic crisis. New enterprises cannot perform this role unless they develop a constructive partnership with external providers of debt financing. Debt cannot be seen simply as a necessary evil to be avoided as much as possible and the calculation of the wealth created in a certain period cannot register an investment paid in cash as an expense. This rudimentary level of financial knowledge puts a constraint to the ability to grow of an enterprise.

Finally, it is interesting to ponder the fact that basic and A&F literacy seems to be higher for ventures that have less than 5 years of history. This result could be interpreted as a signal that

the Spanish economy is living a transition phase. Financial management in older enterprises was more traditional and conservative than financial management in newer enterprises. If this is the case, this is a good sign for the future because if this trend continues we can expect Spanish entrepreneurs to play a bigger role in the post-crisis recovery and they could contribute to create a more modern economic system.

Our survey has allowed us simply to take a snapshot of financial literacy of Spanish entrepreneurs in a specific moment in time. We have already obtained some interesting results. However, in order to give more depth and solidity to our conclusions, it is necessary to start collecting these data regularly and to compare them with the situation in other countries. As it has been done for the study of basic financial literacy, the study of financial literacy and entrepreneurship has to be conducted in a coordinated way at an international level in order to provide solid and robust conclusions. This will allow researcher to disentangle different effects and to understand better which financial concepts need to be spread more widely among entrepreneurs in order to help them taking better decision and be a stronger engine for economic growth.

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