"Financial Literacy Levels of Small Businesses Owners and it Correlation with Firms' Operating Performance"

by

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Master in Finance Dissertation

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2015

Biographical Note

Tânia Fernandes was born on April of 1986, in Maia. The master student finished her degree in Business Administration by Faculdade de Economia do Porto in 2008 and three years later initiated the Master in Finance.

At professional level, she began her carrier in a summer internship at Banco de Portugal (2008), followed by a professional internship in Beta, a venture capital society (2008/2009) and during the following 4 years worked as a credit risk analyst at Norgarante, S.A.

Today, and since May of 2014, she is giving succession to her parents' company, which is a micro enterprise of electrical equipment.

Also, since 2011, she is volunteer in Centro de Apoio ao Sem Abrigo (C.A.S.A), which the main aim is to feed homeless and people in need.

Abstract

In recent years, after the impact of the well-known financial crisis, governments around the world started to express their concern about the levels of financial illiteracy among their citizens, being this problem widely referred as an aggravating factor of this crisis.

As a result, research on financial literacy has been developed by, but mainly focused on personal finance issues involving the general public, leaving a gap with respect to the financial literacy levels among small businesses owners.

Financial literacy is seen as an important instrument for the success of small businesses, since it helps to understand and evaluate the information needed to make daily decisions that have financial impacts in companies' day-to-day management. Therefore, the goal of this research is twofold: to assess the financial literacy levels of small business owners (micro enterprises and small enterprises) in the North of Portugal and to analyze the relation between these results and the operating performance of those companies, as a measure of business economic performance. The study tests the hypothesis that, all other factors being constant, a higher financial literacy level of small business owners should motivate a better performance of the company.

The relevance around the chosen target is justified by the fact that small businesses, defined by micro enterprises and small enterprises, are an important driver for the Portuguese economy since they represent 35% of the total revenues in 2013, through 98% of an universe of 380.000 companies, and employ a meaningful part of national workforce.

The sample in this study is composed by small businesses of the North of Portugal, specifically from the regions of Porto, Braga, Viana do Castelo and Vila Real, and through questionnaires it was obtained the data needed to gauge the levels of financial literacy.

The results evidence a rather level of financial literacy among small business owners of the micro and small business in the North of Portugal. And, the data also supports the existence of a significant positive correlation between financial literacy levels and companies' operating performance. This result highlights the importance of providing to small business owner adequate financial education on the expectation of improving their performance as business leaders.

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1. Introduction

Since the mortgage crisis, governments around the world start to express concerns about the levels of financial illiteracy among their citizens, mainly due to the daily confirmation of the increasing of consumer over indebtedness and, also, of household bankruptcy rates. Moreover, the financial illiteracy has been widely referred as an aggravating factor of this financial crisis (Atkinson and Messy, 2011).

As a consequence, it is also defended that financial literacy should be seen as a public policy objective in order to improve welfare through better decisions making and mitigate the asymmetry between the final consumer and, mainly, the financial institutions (Huston, 2010).

These concerns were rapidly expanded to the scientific community and, nowadays, it is noticed a huge growth of research based on financial literacy matter, mostly in relation with the accurate financial literacy levels, which are seen as indicators to sustain the need for financial education (Huston, 2010).

Another reason for this recent growth on research is related with the effects of financial literacy on individual retirement planning success.

The increasing concern of governments around the world with the straining employer-sponsored for the Social Security System, mainly caused by rise of life expectancies and falling of birth rates, is opening a door for financial literacy as one of the solutions for this matter. Through financial education governments would be able to encourage their citizens to take more self-responsibility for their retirement incomes. (Lusardi and Mitchell, 2011b).

Despite the importance of small businesses in many economies, the major research done so far is mainly focused on personal finance issues of general public, leaving a gap for the analysis of the levels of financial literacy among small businesses (Brown *et al.,* 2006).

Portuguese economy is greatly dependent on the small businesses' activity, including small enterprises[1] and micro enterprises[2]. In the fact, in 2013 these small businesses accounted for 35% the total revenue of our country and for 53% of the total employment (Banco de Portugal, 2014).

This data supports that small businesses are a backbone of the Portuguese economy, so when the financial literacy skills of small business owners fall short, it is more than the individual business that is at risk (Pearl and Eileen, 2014).

The importance of financial literacy it is not only expressed in the failure of small businesses and it consequences, as expressed by Pearl and Eileen (2014). Also, financial literacy plays an important role among those business owners because it provides the financial tools needed to take informed decision, through the accurate understanding of financial information, which largely contributes for the future success of the company. Otherwise, decisions may be poorly taken or lead to advises of accountants or financial advisors (Brown *et al.*, 2006).

So, considering the importance of small businesses at national economy and the little attention that scientific community has given to the measurement of financial literacy levels among this business community, the present study is fulfilling this gap by assessing the levels of financial literacy among small businesses owners in the North of Portugal.

Also, these results are correlated with the actual operating performance of the company, as a measure of the business economic performance of the studied companies.

This second goal of the research has twofold objective: provide statistical evidence of the relation between financial literacy levels of small business owners and the operating performance of their firms, and, in the case of a significant positive correlation, highlight the importance of proving to small business owner adequate financial education on the expectation of improving their performance as a business leaders. Under the belief that is not expected to see a company with a good operating performance, being ran by a owner with a poor level of financial literacy, at the same time, this is the major responsible for the decisions in his company.

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[1] Small enterprise is a company that employs less than 50 workers and presents an annual revenue lower than 10 million euros or an annual balance sheet lower than 10 million euros, according to the 2nd article of Portuguese decree-law nr. 372/2007.
[2] Micro enterprise is a company that employs less than 10 workers and presents an annual revenue lower than 2 million euros or an annual balance sheet lower than 2 million euros, according to the 2nd article of Portuguese decree-law nr. 372/2007.

The level of financial literacy of the entrepreneurs is assessed using the questionnaire methodology, focusing on the three pillars of financial literacy: Financial Knowledge, Financial Behavior and Financial Attitudes (Atkinson and Messy, 2012). The literature does not provide a complete questionnaire with the focus on financial literacy among small business owners, so the built questionnaire comprises the contributes given by the major works developed in financial literacy for personal finance issues and some studies and programs developed by foreign institutions about entrepreneur's financial literacy.

The study also uses the SABI (Iberian Balance Sheet Analysis System) database for the operating performance data of studied companies.

The main findings of this research are the rather low level of financial literacy that small business owners exhibit, since 44% of the sample has a rating 2 or less, on a scale from 5 to 1, where 5 means a very good level of financial literacy and 1 the opposite.

The relation between financial literacy levels and firms operating performance display a significant positive correlation, which strengthen the needs for financial education for business owners in order to improve economic performance of their firms.

The major contributes of this research are to get deeper and improve the methodology of assessment of financial literacy among small business owners through the improvement of the questionnaire; assess for the first time the relation between the levels of financial literacy of small business owners and their firms performance; and, as a result, promote financial education for small business owners on the expectation of improving their performance as business leaders.

2. Literature Review: Financial Literacy and Small Businesses Performance

This chapter presents a literature review about financial literacy and small businesses, as well as, the findings made so far about business owners' financial literacy.

It is divided in the following subchapters: "Financial Literacy", highlighting the importance and attention given to financial literacy after the 2007 worldwide financial crisis; "Financial Literacy and Small Business Performance" and "Assessment of business owners' financial literacy levels", both gathering the two main objectives of the present research, which are to assess the levels of financial literacy among small business owners and to correlate those results with their firms' performance.

2.1 Financial Literacy

Financial literacy, for many years, does not have a unanimous definition at literature, although, recently, Atkinson and Messy (2012) provide an embracing and widely accepted definition of financial literacy gathering three main pillars: financial knowledge, attitudes and behaviors.

Around the world, popular media and public in general used to use various terms as synonymous to describe the concept of financial literacy, for example financial capability, financial culture, financial knowledge and financial education (Huston, 2010).

Also, past studies reveal that in some countries there was a certain trend to consider the studies related with financial knowledge as a good approach of financial literacy (Atkinson and Messy, 2011).

Despite, at that time, the literature could not present a consensus related with an universal definition of financial literacy, the definitions found were designed around same basis and also around the same goal, the individual financial wellbeing.

An example of the financial literacy basis is possible to see through the definition presented by the authors Schagen and Lines (1996), where they define financial literacy,

as the ability to make informed judgments and to take effective decisions regarding the use and management of money.

And, an example of financial literacy goal is possible to notice at definition presented by another author Remund (2010), which state that financial literacy is: "A measure of the degree to which one understands key financial concepts and possesses the ability and confidence to manage personal finances through appropriate, short-term decision-making and sound, long-range financial planning, while mindful of life events and changing economic conditions".

OEDC, through the work developed by Atkinson and Messy (2012), provide, not only an embracing term that could include financial knowledge, financial ability, financial culture, etc, as Financial Literacy, but also a complete and widely accepted definition of financial literacy. This definition gather three important concepts: knowledge, attitudes and behaviors, which are, nowadays, the three pillars that completely describe financial literacy, and results at the following definition: "financial literacy is a combination of awareness, knowledge, skill, attitude and behavior necessary to make sound financial decisions and ultimately achieve individual financial wellbeing" (Atkinson and Messy, 2012).

This definition is on the basis of the most relevant works done so far concerned with gauging the financial literacy levels of general public, such as the OECD Pilot Exercise in 14 countries (2012) from Latin America, Africa, West and East Europe and Asia. And, at a national level, Banco de Portugal (2010) supported the assessment of financial literacy level of Portuguese population under this definition.

The main progresses in Financial Literacy found at literature began after the subprime crisis in 2007, since it was concluded that the lack of financial culture worked as an aggravating factor of this crisis (Huston, 2010).

In one hand, it was found as a common practice the application of investor's savings in complex financial products without fully understand its risks. And, in the other hand, financial institutions were selling financial products without being able to fully understand its financial complexity.

The recent developments in financial literacy research focus on personal finance issue, through the assess of the levels of financial literacy of general public with the aim of

justify the need for financial education, which is believed, that will help to decrease the asymmetric information between citizens and financial institutions and, as a consequence, improve the financial markets efficiency.

Marcolin and Abraham (2006) review, compare and analyze past studies conducted in Australia, United States and United Kingdom related with this matter during that period.

One of the main findings of these authors was concerned with the huge difference among financial literacy measurement of past studies, which result in a great difficulty in creating a true benchmark for the results obtained in those different countries, identifying a gap for future research.

They also emphasize the financial literacy as a pillar to support the need for financial education, since, already at that time, financial illiteracy was been pointed as one of the reasons for financial instability. This phenomenon is a consequence of the easy access to credit and the ready issue of credit cards, alongside with the fast growth of marketing of financial products.

A major worry at that time was the final consumer protection from the lack of information, mainly, from financial institutions, being the goal of financial education to increase the number of informed costumers in order to them make better decisions and to minimize their chances of being misled on financial matters. The competition between financial institutions in order to gain market share increase this phenomenon of asymmetric information.

Another, and not less important, social-economic happening that largely supports the need for financial education is noticed with Government's encouragement for its citizens to take more self-responsibility for their retirement incomes.

Governments around the world, concerned with this problem, are changing their course by encouraging citizens to take more responsibility for their retirement incomes and do not be totally dependent of public pensions (Beal and Delpachitra, 2003).

In relation to financial literacy levels, Marcolin and Abraham (2006) emphasized a contradiction found out at the results of the studies explored, related with the low level of financial literacy among university students when, in general, past studies have

shown that individuals with higher level of education have higher levels of financial literacy.

In the years that followed the financial crisis, it was possible to witness to an increasing research related with financial literacy, due to the fact of being the financial illiteracy widely pointed as an aggravating factor of that crisis. And one of the major aims of this recent research is to sustain the need for financial education in order to protect final consumer from even more complex financial product available at market (Atkinson and Messy, 2011).

Huston (2010) carried out a similar work, by exploring 71 past studies related with financial literacy and mainly found out inconsistencies at the definition of the subject and also in the measurement techniques.

In the last couple years OECD has done major advances concerning with research on financial literacy, since it could provide a wide world accepted definition of financial literacy and also for the very first time a benchmark of financial literacy levels for 14 countries around the world (Atkinson and Messy, 2012).

As a result of this globalization of financial literacy measures standards, it was stated that "financial illiteracy is widespread even when financial markets are well developed or changing rapidly." – (Lusardi and Mitchell, 2011b)

2.2 Financial Literacy and Small Business Performance

The rare literature about small business owner's financial literacy provides a slightly different definition of financial literacy, being the main distinction related with the understanding of information provided by financial statements. Instead of financial knowledge being only focus on the comprehension of borrowing and saving matters, interest compounding, concept of inflation and risk diversification. A small business owner must be able to evaluate the information needed to make decisions that have financial ramifications or consequences on the business.

According to Brown *et al.* (2006), financial literacy for small business owners must contemplate the ability to read and understand fundamental financial statements, as well as, the ability with numbers, in order to make informed judgments and to make effective decisions regarding the use and management of money.

A recent work from two authors describes financial literacy as "the ability to understand and use business financial statements to generate key financial ratios to evaluate and manage a business." – (Pearl and Eileen, 2014)

Despite the definition of financial literacy regarding personal finance issue be more developed and widely accepted, the definition of financial literacy regarding small business is much more demanding, not only, for financial knowledge, which must contemplate the capability of read and understand financial statements information, but also in financial behavior, with the habits concerned with the analysis of financial information, and financial preferences or attitudes, which must be positively correlated with financial knowledge and behavior, in the moment of taking the daily management decisions.

However, as it has not been given much attention to financial literacy of small businesses owners, the literature does not provide an embracing definition of financial literacy in business context. Differing to what happens with financial literacy for personal finance issues.

Since many economies around the world are dependent of the success of small businesses, which is also the case of Portugal, it is important not only provide the levels of financial literacy of general public, but also gauge the levels of financial literacy of small businesses owners.

In most of small businesses is common to find its owner as an employee, which is mainly focus on the operational area of the business, forgetting the strategy and planning of the business activity, and where financial education could make the difference, by improving business owners' financial skills. In fact, Brown *et al.* (2006), with an educational program, evidence the rise of financial literacy among entrepreneurs, and Pearl and Eileen (2014) could evidence the relation between financial literacy and the success of small businesses, by clearing the connection between the inadequate financial literacy and financial difficulties experienced by entrepreneurs.

According to Banco de Portugal, between 2010 and 2013, on average, the number of small business, micro enterprises and small enterprises (according to the division set by Portuguese law, under the 2nd article of the decree-law nr. 372/2007), increased 1% per year, despite the number of Portuguese employed by those companies decreased 2% per year. Mainly due to small enterprises since micro enterprises registered a different path by growing 1.7% per year.

The total revenue of small business at that timeline has an unfavorable performance by falling around 4% per year, but still representing 35% of total revenue, in 2013.

Despite this evolution, and according to the same source, in 2013, the micro and small enterprises together employed 53% of Portuguese workers, against 27% of big enterprises and 20% of medium enterprises.

The studies at literature about small business owner's financial literacy are very scarce and it was not found anyone similar to the present research in order to establish a benchmark.

Sage (2012) carried out a survey about Canadian Small Business Financial Literacy, with a sample of 300 small businesses, where it gauges the perceptions, knowledge and habits of small business owners related with financial and resources management.

The main results of this survey provide the perception of the respondents about the areas they need to learn more about (financial planning, tax payment and cash-flow), the areas they feel more comfortable with (dealing with clients, dealing with suppliers and managing the finances of their businesses) and the areas where they fail most of the

time (dealing with taxes, managing sales and marketing and managing the finances of their businesses).

Despite the interesting finding of Sage Canadian Survey, their results are based on respondents' perceptions and not so much on specific understanding of financial statements, correspondent to the financial knowledge, which is a fundamental pillar to provide accurate levels of financial literacy. Additionally, some of the question of this survey where asked in order to understand the frequency of usage of technology and accounting software, which is reasonable considering the institution which carry out the study.

Brown *et al.* (2006) carried out a study based on financial literacy of small businesses owner-entrepreneurs in their first year of activity. The basis of this study is settled on a program called "Training in Business Basics", specially created for this population target of new small businesses with less than ten employees.

The authors, in order to carry out their study, provide 147 small businesses of United Kingdom in their first three years of life with educational modules based on basic finance. The argument behind this study is on the belief that small business owners with the adequate financial education will be less needed of accountants and financial advisors on trust, in order to understand the financial position of their companies and make informed financial decisions by their own.

Although, and similarly to Sage (2012), the major findings of these authors are mainly related to perceptions of financial awareness and literacy, they concluded that, even though the participants appeared to be aware of their own lack of financial literacy, still they did not perceive the importance of this matter in relation to other aspects of running a small business.

Pearl and Eileen (2014) surveyed 14 small businesses owners in Florida in order to determine their level of financial understanding and their usage habits of financial statements in making management decisions, which is almost the same to say, that they were gauging the levels of financial literacy. Since, according to their study Small-Business Financial Literacy is defined "as the ability to understand and use business financial statements to generate key financial ratios to evaluate and manage a business".

The questions used in their survey focused mainly in two of the three pillars that sustain the definition of financial literacy widely accepted according to the literature: Financial Knowledge and Financial Behaviors, excluding, Financial Attitudes.

The authors mainly conclude with this case study that was a clear connection between lack of financial literacy and financial difficulties experienced by entrepreneurs, and adequate financial education can partially decrease the financial difficulties.

Couto (2013) studied the Portuguese entrepreneurs financial literacy levels of incubators' companies for North and Center of Portugal, although the questionnaire used in order to carry out her work was essentially based in questions about entrepreneurs confidence levels and financial behavior, without include any question about financial knowledge, which is a pillar, not only, for financial literacy in personal finance issues, but also a main matter in gauging the financial literacy levels of small business owners according to the literature. Despite this gap, the major findings of her work shown that 66% of studied sample present a good levels of financial literacy.

Considering the studies found so far at literature about the financial literacy levels of small business owners, it is possible to notice that there is no one that could possible serve as a benchmark for the present research.

This gap at literature sustain the need for this investigation, which has two main goals: assess the levels of financial literacy of small business owners and correlate this literacy level with their firms' performance.

To the best of our knowledge, there are no studies in the literature analyzing the relation between the companies' operating performance and the financial literacy levels of small business owners. This is quite normal due the scare literature about financial literacy among small business owners.

Since it is especially the owner or the structure and functioning of the board that can directly affect the operating efficiency and operating performance of the company, the argument behind the study of the relation between these two variables, operating performance and business owners' financial literacy levels, is on the belief that a high level of financial literacy of a business owner should positively influence firm's operating performance, through their financial knowledge, attitudes and behaviors.

The expected results of this relation or, in other words, facing an expected positive correlation between the mentioned variables, will not only strengthen the results obtained through the built questionnaire, but also, it will works as a evidence for the need for education towards financial matters.

The search for the operating performance model at literature was mainly concerned with the characteristics of those variables, the operating performance as dependent variable and the financial literacy levels as an independent variable and also measured as a rating on a scale of 5 to 1, where, in our study, 5 represents a very high financial literacy level and 1 a very low financial literacy level.

For this study an adaptation of Bauwhede (2009) model is used. Bauwhede analyses the relation between corporate governance compliance and operating performance for a set of large listed European companies. The model explains firm's operating performance, measured by Return on Assets (as a proxy), through the following variables: CG Comp, which is a rating proxying for the extend of compliance with international best practices regarding board structure and functioning of firms; LEV, measured by leverage ratio; LNTA, for firm dimension, measured by the natural logarithm of total assets; and a industry dummy variable.

The main variables of this model, operating performance and rating as a proxy to the extent of compliance with international best practices regarding, have similar characteristics to the variables that the study of the relation between operating performance and financial literacy levels of small business owners have.

The operating performance as dependent variable is the same and it measure is the return on assets (ROA) which is designed by the division of operating income by the average of beginning-and-ending-period book value of total assets. Where operating income, according to Loughran and Ritter (1997), is defined as OIBD and measured as operating income before depreciation, amortization, and taxes, plus interest income.

This is the measure of operating performance most commonly used, among others, by the studies performed by Loughran and Ritter (1997), Deshmukh *et al*. (2015), and Pearl and Eileen (2014). Although other authors go further by saying: "The ROA is clearly the preferred measure of operating performance because it is less affected by

discretionary items than the ROE and the NPM." - Bauwhede (2009). Where ROE is the return on equity measure, and NPM is net profit margin measure.

The most relevant independent variable, a rating proxying for the extent of compliance with international best practices regarding board structure and functioning for firm i in year t, similar to the present study, the rating is measured on a scale of 5 to1.

2.3 Assessment of business owners' financial literacy levels

Around the world, the measurement of financial literacy is mainly concerned with personal finance issue of the general public (Brown et al., 2006).

Lusardi and Mitchell (2011), in their work refer the difficulty of measure the financial attitudes and financial behaviors in order to achieve financial literacy levels. Based on that, and keeping in mind four key principles: simplicity, relevance, brevity and capacity to differentiate, they design three questions which provide answers to three important economic concepts that individuals should have in order to make financial decisions, which are: (1) understanding of interest compounding; (2) understanding of inflation; and (3) understanding of risk diversification.

These questions have been used in several studies as a benchmark to allow for international comparisons of financial literacy levels, such as, Lusardi and Mitchel (2009); Financial Capability Study (2010); Lusardi *et al.*(2010); Banco de Portugal (2010); Lusardi and Mitchell (2011a); Atkinson and Messy (2012). And they are:

(1) *"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

(2) 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?

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

(3) 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"

Despite the important information provided by the answers of those questions, the authors expressed another concern with the difficulty in establish comparisons about the results of past studies, since the questions differ a lot across countries (Lusardi and Mitchell, 2011b).

In order to over pass this difficulty, OECD has made so far the major improvements concerned with benchmarks for financial literacy levels. This organization proposed a complete questionnaire that includes questions about: Financial Knowledge, Financial Behavior and Financial Attitudes (Atkinson and Messy, 2012).

This questionnaire was on the base of pilot project which aimed to gauge the levels of financial literacy in 14 countries around the world, and for the very first time, this organization was able to provide to the world a benchmark of financial literacy levels among 14 countries (Atkinson and Messy, 2012).

In Portugal, in 2010, Banco de Portugal studied the levels of financial literacy of Portuguese population through a implementation of a questionnaire which include some questions related with the understanding of interest compounding, understanding of

inflation and understanding of risk diversification, according to the contribute of the authors Lusardi and Mitchell (2011). And the main goal of this project was to decrease the asymmetric information between citizens and financial institutions since, they believe that "more informed citizens are able to better learn the information that is transmitted to them by financial institutions, helping to monitor markets" – (Banco de Portugal ,2010).

Lastly, it is important to note that the questionnaires used at the referred works were designed to assess the levels of financial literacy for personal finance issues, although they are a key reference in the assessment of financial literacy levels among small business owners.

3. Study Objectives and Hypothesis

There are two main objectives for this study: to assess the literacy levels among the small business owners in the North of Portugal and to analyze the relation of financial literacy levels with the firm performance.

The assessment of the levels of financial literacy among small business owners intends to fill in a gap in the literature review by creating an index, similarly to the work developed by Banco de Portugal, in 2010, when studying the financial literacy levels of Portuguese population, which enables the comparison between every small business owner.

This index will be presented further on, as well as, the explanation about its construction.

For this part of the analysis the study hypothesis are as follows.

Hypothesis 1: "*Male small business owners present higher financial literacy levels than female gender*"

According to the study of Atkinson and Messy (2012), despite being focused in personal finance issues, these authors stated that male gender present higher financial literacy levels.

Couto (2013), in her investigation of financial literacy levels among entrepreneurs, also tested the differences between male and female entrepreneurs financial literacy levels and, although on average the female entrepreneurs presented a lower levels of financial literacy compared to male gender, she did not found statistical significance in her tests.

Hypothesis 2: "*Small business owners with higher education present higher financial literacy levels*"

Brown *et al*. (2006), Atkinson and Messy (2012), Banco de Portugal (2010) and, also, Couto (2013) found evidence that low levels of education were associated with lower levels of financial literacy.

Hypothesis 3: "*Small business owners with education in/or related with economics present higher financial literacy levels*"

Brown et al. (2006) conducted a study where it was demonstrated the increase of financial literacy levels among owner managers, through a year program of financial education.

Couto (2013) found also evidence that entrepreneurs with education in economics area presented higher levels of financial literacy.

Hypothesis 4: "*Younger small business owners present lower financial literacy levels*".

The evidence in the literature about this hypothesis it is not consensual. Brown et al. (2006) and Banco de Portugal (2010) found evidence of lower levels of financial literacy among young entrepreneurs, in the case of the first author, and among younger individual, in the case of the second. Instead, Couto (2013) considered her sample composed with a majority of younger entrepreneurs and her major findings where that they possess good levels of financial literacy.

Hypothesis 5: *"The financial literacy levels of small business owners are higher in bigger firms."*

Couto (2013) tested a similar hypothesis in her work, but for two of three business characteristics of dimension, number of workers and revenue, she did not found statistical significance.

Hypothesis 6: *"Small business owners responsible for companies' financial area present higher financial literacy levels than those who trust the financial area to accountants."*

Brown et al. (2006) found as a common practice among small business owners to trust the responsibility of financial area of the companies in the accountants.

In the second part of the study, the results obtained for the financial literacy levels of small business owners will be correlated with the operating performance of their companies using the operating performance model developed by Bauwhede (2009), properly adapted to the present study. This model will be explored and better explained further on. The study hypothesis is:

Hypothesis 7: *"There is a positive relation between the financial literacy levels of small business owners and the performance of their firms."*

4. Methodology and Data

This chapter presents the adopted methodology, mainly about how the information was gathered for the built questionnaire, the sample calculation and characterization, the index construction and also the adapted operating performance model.

4.1 Questionnaire

This study uses the questionnaire methodology to assess the financial literacy levels of small business owners, similarly to the most relevant studies developed so far focused on personal finance issue of general public, such as, at a global level, in Atkinson and Messy (2012) and, at a national level, Banco de Portugal (2010).

The questionnaire (Appendix A) is composed by four major areas of questions: Respondent Characterization, Financial Knowledge, Financial Behavior and Financial Attitudes, being these last three components from the definition of financial literacy world widely accepted (Atkinson and Messy, 2012).

The first one, Respondent Characterization, includes questions which answers are the base for most of the study hypothesis already mention at Purposes of Investigation chapter. Also, includes a space to indicate the fiscal number of the company, which enables to access the economic and financial information available on SABI (Iberian Balance Sheet Analysis System), in order to calculate the operating performance of each company. And at end, a question about the perception of the financial literacy level of each small business owner, in order to establish a comparison between this self-assessment and the results obtained from the questionnaire.

The Financial Knowledge section includes not only questions about understanding of interest compounding, inflation and risk diversification, according to contributes in this matter of Lusardi and Mitchell (2011), although purposely adapted to the business environment. But, has also questions about the understanding of financial statements which, according to the literature review, should be the base for the questions of financial knowledge in the context of business financial literacy.

The questions of Financial Behavior and Financial Attitudes are represented at the same group of question, due the connection between them, and represent an adaptation of the contributes provided by Lusardi and Mitchell (2011) from the personal finance issues transported to the business environment and business daily routines aspects. And also, incorporate contributes from the authors that have explored financial literacy in small businesses, which are Brown *et al*. (2006), Pearl and Eileen (2014), Couto (2013).

Those questions include the following themes: business plan, cash flow forecast, profitability analysis and bank loans.

A pilot questionnaire was implemented to three small business owners, whose answers were not included in final results, in order to understand if the questionnaire was well built and if the questions were well understood by the respondents.

After the pilot questionnaire, some questions were improved, with the extension of the number of possibility answers, and also added another question about financial knowledge in business context.

4.2 Sample

This section presents the sample size determination that guaranteed its representativeness and the characterization of the obtained sample.

4.2.1 Sample Size Determination

The sample of the present work is composed by respondents of micro and small enterprises from the North of Portugal, according to the division settled by Portuguese law (decree-law nr. 372/2007, 2nd article), and referred in this work as small businesses. The choice of the northern region is due the geographical proximity.

It was determined taking into account the formula calculation, explained below, and the distributions of micro and small enterprises number in the North of Portugal.

In 2014 the number of micro enterprises in the North of Portugal was of 96.206 and the number small enterprises of 11.704, which represents respectively 89% and 11% of universe of small businesses of the present work.

In order to determine the planned quote needed to proceed forward with this study, it was taken into account the polytomous characteristic of results of the studied variable. And "there are two methods to determine sample size for variables that are polytomous or continuous. One method is to combine responses into two categories and then use a sample size based on proportion. The second method is to use the formula for the sample size for the mean." – (Israel, 1992). The mention formula is represented below:

$$ n_0 = \frac{Z^2 \cdot \sigma^2}{e^2} $$

Where,

n_0 = sample size,

Z = Z statistic for a level of confidence,

σ = population standard deviation of the studied variable,

e = Margin of error or maximum error of the estimate. It identifies the maximum difference between the sample and the true population mean.

For the sample size calculation of the present work it was considered the second method, which uses the formula above. The preference for the second method, instead of the first, is justified by the need in the first method of an assumption of the portion results and the actual literature does not offer responses to this.

Thus, considering a confident level of 95%, the standard deviation of the first 30 financial literacy levels obtained, which is 15, and margin of error of 3, the global planned sample obtained is of 99 (Table 1).

Table 1 – Global Planned and Performed Sample

	Planned Sample		Performed Sample	
Micro Enterprises	90	91%	89	86%
Small Enterprises	9	9%	14	14%
Total	**99**	**100%**	**103**	**100%**

In order to transport the reality of the distribution of micro and small enterprises across the North of Portugal, Table 2 and Table 3, exhibit the planned sample for micro and small enterprises, respectively, distributed by the regions of North of Portugal. And also the performed sample for each region, which in a global exceeded the planned quote.

Table 2 – Micro Enterprises: Planned and Performed Sample distributed by regions of the North of the country

	Number of Firms		Planned Sample		Performed Sample	
Porto	57.862	60%	53	60%	64	72%
Braga	24.380	25%	22	25%	16	18%
Viana do Castelo	6.046	6%	6	7%	7	8%
Vila Real	4.567	5%	4	5%	2	2%
Bragança	3.351	3%	3	3%	0	0%
Total	**96.206**		**88**		**89**	

Table 3 – Small Enterprises: Planned and Performed Sample distributed by regions of the North of the country

	Number of Firms		Planned Sample		Performed Sample	
Porto	6.663	57%	6	55%	9	64%
Braga	3.705	32%	4	36%	4	29%
Viana do Castelo	701	6%	1	9%	1	7%
Vila Real	412	4%	0	0%	0	0%
Bragança	223	2%	0	0%	0	0%
Total	**11.704**		**11**		**14**	

4.2.2 Sample Characterization

The questionnaires were administered during 8th of July until 19th of August, through three ways: on-line via email, by telephone and in person. It was possible to gather the answers of 103 owner managers, being enough to achieve the global planned sample. Although responses were not anonymous, in order to validate the name of the owner manager with the information available on SABI about shareholder structure, assurances were given regarding confidentiality.

The companies of small business owners' respondents that have their headquarters in Porto represented 71% of the sample, Braga 19%, Viana do Castelo 8% and Vila Real 2%.

The half of companies' activity is concentrated in the Retail Trade (24%), Wholesale (19%) and Restaurant Service (8%), as it can be verified at Table 4.

Table 4 – Distribution of Business Activity Codes (2 digit codes)

Activity Code 2 digits	Designation	Number of respondent	%
10	Food Industry	3	3%
13	Manufacture of textiles	3	3%
16	Manufacture of wood and cork	1	1%
23	Manufacture of other non-metallic mineral products	1	1%
27	Manufacture of electrical equipment	3	3%
33	Repair, maintenance and installation of machinery and equipment	3	3%
41	Real estate development (development of building projects); construction of b	1	1%
43	Specialized construction activities	7	7%
45	Sale, maintenance and repair of motor vehicles and motorcycles	4	4%
46	**Wholesale (including agents), except of motor vehicles and motorcycles**	**19**	**18%**
47	**Retail trade, except of motor vehicles and motorcycles**	**25**	**24%**
49	Land transport and transport via pipelines	1	1%
52	Storage and auxiliary transport activities (including handling)	1	1%
55	Accommodation	2	2%
56	**Restaurant service**	**8**	**8%**
58	Publishing activities	2	2%
62	Consulting and computer programming and related activities	1	1%
66	Auxiliary activities of financial services and insurance	3	3%
68	Real estate activities	1	1%
69	Legal and accounting activities	1	1%
70	Head offices activities and consulting for management	3	3%
71	Architectural activities	1	1%
74	Other consulting activities, scientific, technical and similar	2	2%
79	Travel agencies, tour operators, other reservation service and related activities	1	1%
81	Activities related to buildings, planting and maintenance of gardens	1	1%
82	Administrative and support services activities provided to companies	1	1%
85	Education	1	1%
90	Theater activities, music, dance and other artistic and literary activities	1	1%
96	Other personal service activities	2	2%
		103	

In relation to gender, the majority of the respondents are male, 71% of the sample, against 29% that represent the female gender.

The majority of the respondents have more than 35 years old (86%), although with a higher concentration in the group age between 35 and 44 years (32%), as can be observed in Chart 1.

Chart 1 - Age of small business owners' respondents
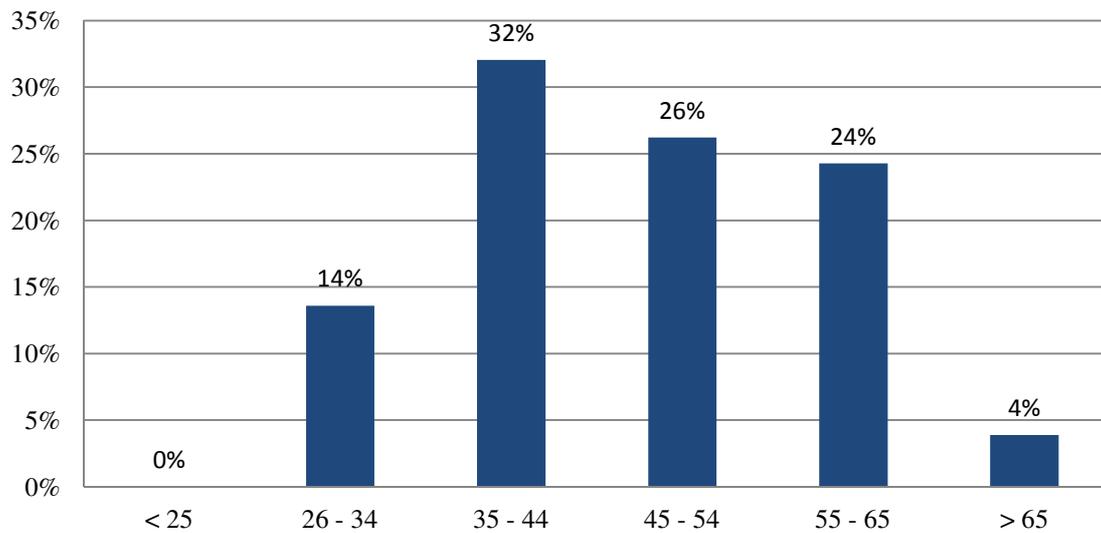
The majority of the respondent's presents an education level lower than the higher education (70%), and only 30% presents an education level with First Degree and Master Degree or higher (Chart 2). And only 9% of the respondents have higher education in economics.

Chart 2 - Education Level of Small Business Owners

Master's Degree or higher **6%**

Less than Compulsory Education **11%**

First Degree **24%**

Compulsory Education (9th year) **23%**

Highschool (12th year) **36%**
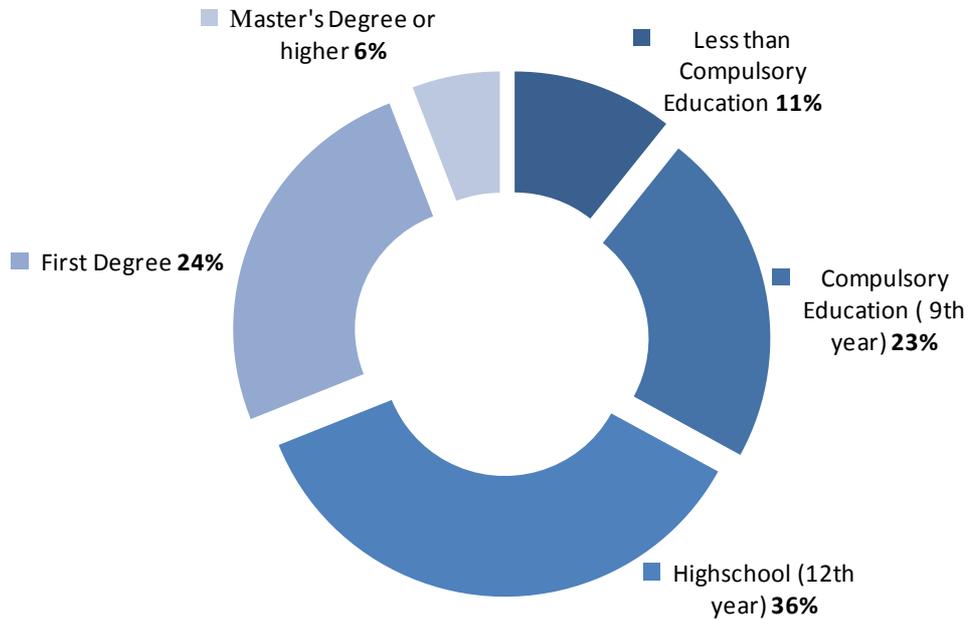
In relation to the trust of financial area of the companies, the majority of the business owners take that responsibility, although ¼ of small business owners' respondents trust the financial area to their accountants (Chart 3).

Chart 3 - Financial area responsible

66

28

9

Business Owner   Accountant   Financial Department
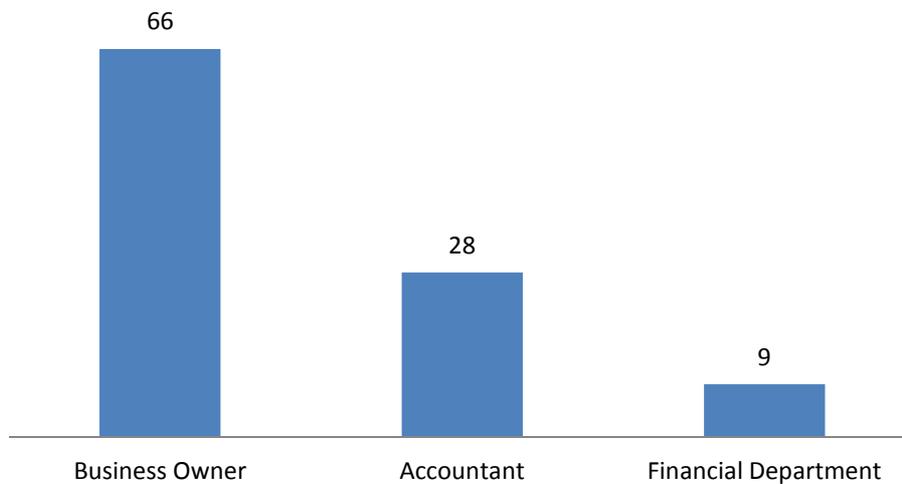
4.3 Financial Literacy Index

In order to assess the financial literacy levels of small business owners at the various dimensions considered in the questionnaire it was built an index using the methodology in Banco de Portugal (2010).

It is important to refer that the index should not be interpreted in absolute values for the evaluation of financial knowledge, behaviors and attitudes of small business owners. It can only be interpreted in relative terms when comparing values among different groups of individuals.

The questions about the respondent characterization were not included in the index construction.

The answers to the questions of financial knowledge, behavior and attitudes were classified in a scale of (-2, -1, 0, 1, 2), in order to produce a global indicator of financial literacy. But, not all the questions are able to have this scale, due to the variability of acceptable answers. In the financial knowledge questions, the correct answer received the maximum punctuation (2) and all the others the minimum (-2). In the questions that evaluate the behavior, the maximum punctuation is attributed to the most appropriated behavior.

As a result, the index is constituted through the arithmetic sum of collected punctuation and then transformed in a scale from 0 to 100, being 0 the potential minimum and 100 the potential maximum of punctuation.

Further on, the results are displayed in a global index and a partial index, using the same methodology in Banco de Portugal (2010). The global index includes the sum of the punctuation in the three pillars of financial literacy: financial knowledge, financial attitudes and financial behavior. And, the partial index exhibit three sub-index for each of mentioned pillars.

4.4 Operating Performance Model

The operating performance model was adapted from Baudwhede (2009) to analyze the relation between the financial literacy levels of the small business owner and the performance of their firms. The analysis also controlled for the leverage, dimension and the activity sector of the firm. The model that as used is:

$$\text{Performance}_i = \beta_0 + \beta_1 \text{Rating\_FLI}_i + \beta_2 \text{LEV}_i + \beta_3 \text{LNTA}_i + \beta_4 X_i + \varepsilon_i$$

Where:

Performance$_i$ = ROA of firm i;

Rating_FLI$_i$ = a rating from financial literacy index for firm i;

LEV$_i$ = leverage ratio for firm i;

LNTA$_i$ = the natural logarithm of total assets for firm i;

X$_i$ = a vector of industry dummies, i. e. indicator variables for the Portuguese business activity classes.

ROA is the ratio between the operating income and the average of beginning-and-ending-period book value of total assets. The operating income is measured by the operating income before depreciation, amortization, and taxes, plus interest income.

The rating financial literacy index was scaled from 5 to 1, according to the information in Table 5.

Table 5 – Financial Literacy Index (FLI) and corresponding rating level

FLI	Rating Level
Between 0 and 25	1
Between 26 and 50	2
Between 51 and 70	3
Between 71 and 85	4
Between 86 and 100	5

Leverage ratio meant to measure the company's debt levels, through the sum of short-term and long-term debt divided by total assets.

LNTA is a proxy for the dimension of the firm measured by the natural logarithm of total assets.

X includes 12 dummy variables for the every class of industry of tested sample (Table 6).

Table 6 – Industry Dummies Variables

	Class Industry	Number of Firms
C	Manufacturing industries	13
F	Construction	6
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	41
H	Transportation and storage	1
I	Accommodation, restaurant services and similar	9
J	Activities of information and communication	3
K	Financial and insurance activities	3
L	Real estate activities	1
M	Advisory activities, scientific, technical and similar	5
N	Administrative activities and support services	4
P	Education	1
R	Artistic activities, shows, sport and leisure	1
		88

5. Results analysis

5.1 Descriptive analysis of results – Financial Literacy Index

The companies that made part of this study mainly belong to trade industry, being 24% from the retail industry and 18% from the wholesale industry.

Table 7 exhibits the descriptive statistics of firms' revenue and number of workers. Although the maximum values are very high, the medians are comparably lower, due the sample be composed mainly for micro enterprises.

Table 7 – Descriptive Statistics: Firms Revenue and Number of Workers

	Maximum	Minimum	Mean	Median
Total Revenue	10.160.221€	8.122€	630.000€	224.000€
Number of Workers	42	1	7	4

The majority of the companies have more than 10 years in the market, having 35% more than 20 years. The average of the maturity found on the sample is of 19 years, although the median is lower in 14 years, and the oldest company has 89 years and the younger 3 years.

It is important to note that 15 of the companies are registered as sole traders and those financial statements are not available on SABI platform, as well as general information, so 15 % was excluded from the total revenue, number of workers and maturity information give above.

In relation to global financial literacy index, which comprise the three components of financial literacy definition (financial knowledge, behavior and attitudes), the minimum punctuation observed is 3 and maximum almost hits the 100 with 91, as is possible to see in table below about the descriptive statistics of the obtained financial literacy index (Table 8).

Table 8 – Descriptive Statistics: Original and Global Financial Literacy Index

	Minimum Observed	Maximum Observed	Mean	Median	Standard Deviation
Original Financial Literacy Index	-32	28	2	3	14
Global Financial Literacy Index	3	91	53	54	21

The average and the median are very near of each other with, respectively, 53 and 54, suggesting that, on average, the Portuguese small business owners present rather low financial literacy level. Table 9 presents the distribution of respondents across financial literacy rating levels showing that 44% of the respondents have extremely low financial literacy levels.

Table 9 – Rating equivalence of Financial Literacy Index

Punctuation in %	Rating Level	% of Small Business Owners
Between 0 and 25%	1	11%
Between 26 and 50%	2	33%
Between 51 and 70%	3	31%
Between 71 and 85%	4	19%
Between 86 and 100%	5	6%

The reason why behind the fact that punctuation in percentage (first column of table 4) does not present a uniform distribution is because only above 50% the small business owners presented a positive punctuation at the original index, meaning that the correct answers are above the wrong answers.

The comparison of these results with the self-evaluation question about the respondents' financial literacy level: "On a scale of 1 to 5, where 1 is bad and 5 is very good, what do you consider to be your level of financial literacy? (Financial literacy is a combination of awareness, knowledge, skills, attitudes and behavior needed to make sound financial

decisions, in order to achieve individual financial well-being.)", is presented at the Table 10.

Table 10 – Small Business Owner's Rating: Index Results vs. Self-Evaluation

Punctuation in %	Rating	% Respondents Index Results	vs	% Respondents Self-Evaluation
Between 0 and 25%	1	11%		0%
Between 26 and 50%	2	33%		11%
Between 51 and 70%	3	31%		52%
Between 71 and 85%	4	19%		34%
Between 86 and 100%	5	6%		3%

The results suggest that the respondents tend to overestimate their financial capabilities. This only not happen in the group with higher knowledge and is particularly accentuated in the lower level of financial literacy where none of the 11% of entrepreneurs recognize to be in that situation.

Considering the partial financial literacy level, divided by the three components of financial literacy definition, the highest punctuation is reached in Financial Attitudes and Behaviors. The Financial Knowledge did not go further than the 89 points as a maximum, according to the Table 11.

Table 11 – Descriptive Statistics: Partial Financial Literacy Index

	Minimum Observed	Maximum Observed	Mean	Median	Standard Deviation
Knowledge	0	89	50	56	24
Attitudes	0	100	80	83	25
Behavior	0	100	41	33	30

The Financial Knowledge questions are divided in two groups. The first five questions are related to standard financial literacy issues for personal finance (interest compounding, inflation and risk diversification) by the authors Atkinson and Messy (2012), but transformed for the business environment.

The last four questions are about knowledge of financial statements given that, according to authors Brown et al. (2006) and Pearl and Eileen (2014), financial literacy among small business owners is defined by their level of use and understanding of financial statements and analysis of financial ratios in order to make sound management decisions, analysis of financial ratios.

According to the Chart 4, on average small business owners present a reasonable knowledge about interest compounding, inflation and risk diversification, but a rather low understanding about financial statement matters, which is a problem that only can be solved with education.

Chart 4 - Average Financial Knowledge Index
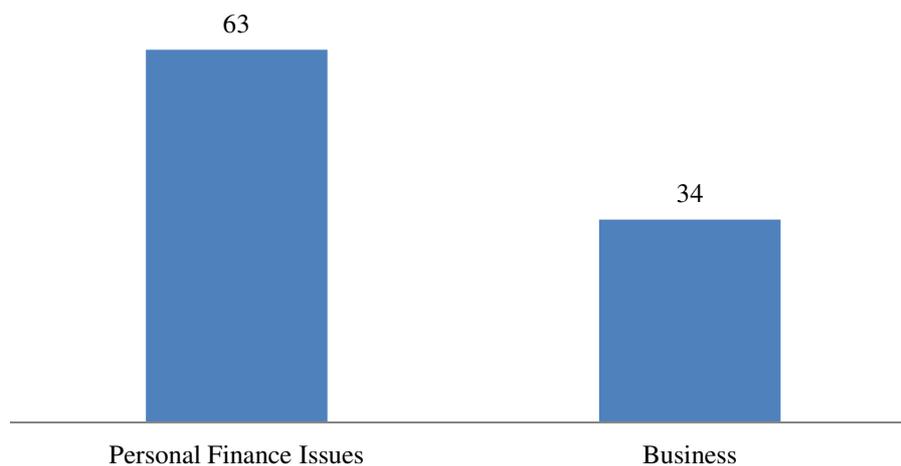
The Financial Behavior has the lowest punctuation average, with 41, contrasting with the highest average on Financial Attitudes, with 80. Although it is important to note that the questions about Financial Attitudes and Financial Behavior were presented at the same group of questions due to its connection between each other, so on average the small business owners have the right attitude towards determined subject, but in practice their actions or behavior do not reflect their intentions.

For example, considering three questions addressed in the work of Couto (2013) related with the elaboration of the business plan at the beginning of the activity, many respondents considered it very important, but in practice, before the opening of their

companies they did not elaborate a business plan. Only 37% of the business owners elaborate the business plan at the beginning of the activity, while 80% of the respondents considered important or very important it realization not only at the beginning of the activity but also facing the need of an investment (Chart 5).

Chart 5 - Realization of the business plan at the beginning of the activity
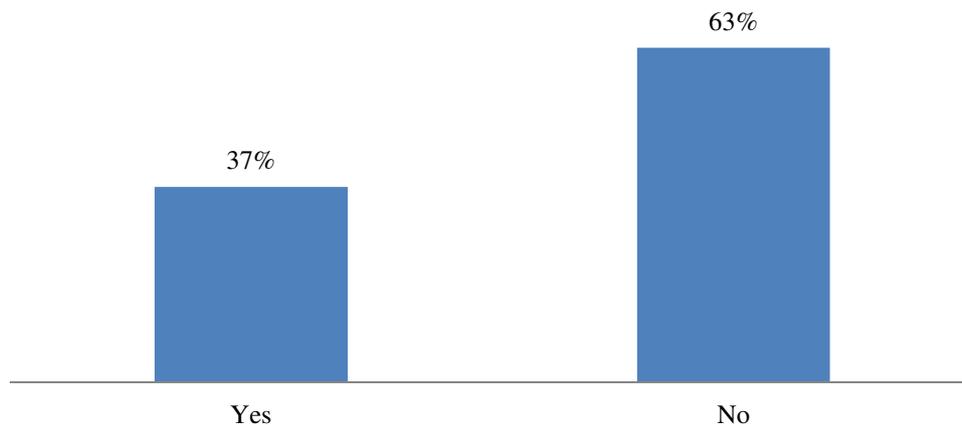
A similar analysis can be made for de questions 25 e 26 of the questionnaire (see Appendix A), which are respectively: "Do you consider important the periodic analysis of company's profitability, in order to minimize costs and maximize profits?" and "How often do you it?", and are related with a crucial periodic business procedure which results in an important warning concerned with business financial health (Pearl and Eileen, 2014).

Almost the totally of the respondents (90%) considered important or very important the periodic analysis of company's profitability, but more than half of the respondents (51%) have the wrong behavior towards this business procedure since they never or only once a year do the company's profitability analysis, as it is possible notice from the Chart 6.

Chart 6 - Frequency of company's profitability analysis
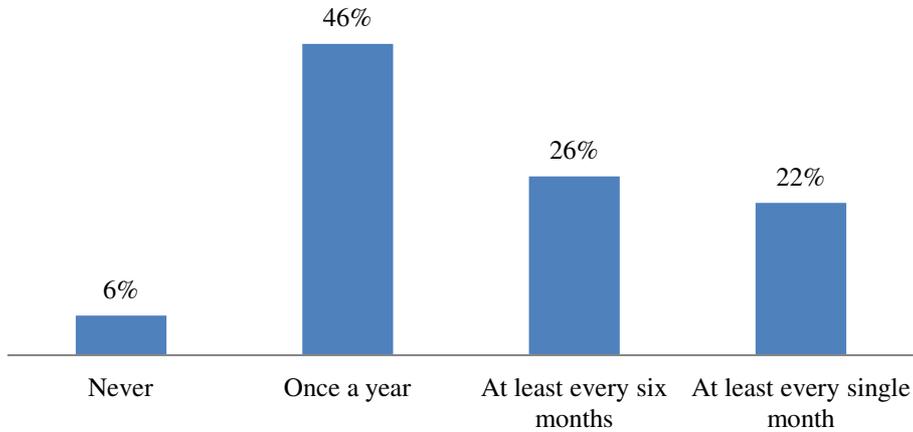
The questionnaire also included questions about cash flow forecast preparation, due to the contributions of Brown et al. (2006), and the results exhibited that the majority of the small business owners of the sample (60%) admitted to not know how to do a cash flow forecast. However, from the remaining 40%, only 19% take the best behavior towards this subject, which to prepare the cash flow forecast at least every single month (Chart 7).

Chart 7 - Frequency of cash flow forecast preparation
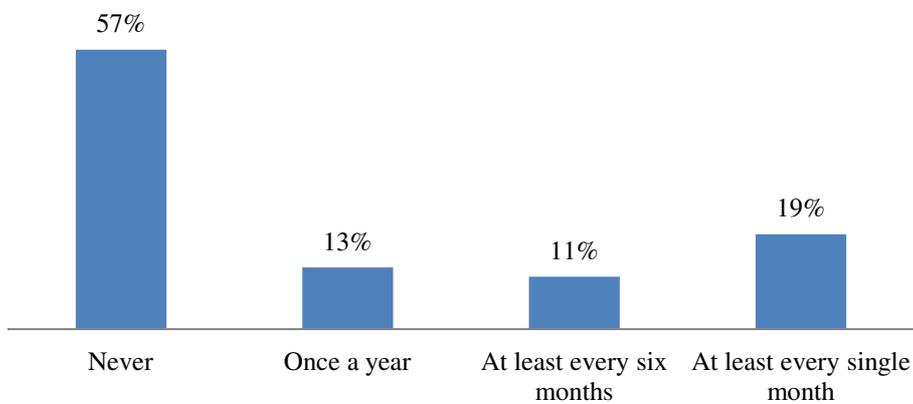
In order to fund their business, some of the respondents currently have bank loans, and, due to this reality, there were selected two questions to better understand if they followed the baking conditions and renegotiated the same (Banco de Portugal, 2010).

In the sample, 41% of small business owners do not have any contracted bank loan and the remaining respondents which have bank loans, only 26% admitted to monitor and renegotiates the credit conditions at least once a year.

The majority of the respondents shows a passive attitude towards the conditions of a bank loan after its contracting and do not review the contracts terms in order to update it to market conditions and minimize the financial losses.

Small business owners tend to overestimate their capacities, since only 11% admitted to have a rather low level of financial literacy, when the results exhibited to be four times higher in the number of small business owners in this situation. The results also showed that small business owners have the right attitude towards financial matters although financial behavior does not follow this trend.

5.2 Statistical analysis of the factors that influence the financial literacy index of small business owners

To get a better understanding of financial literacy of small business owners the results are further analyzed looking for the factors that influencing its variables.

In order to determine the appropriate statistical test, it is required to test the normality of index distribution. The conducted tests were: Kolmogorov-Smirnov test and Shapiro–Wilk test. Table 12 exhibits the results obtained for those tests with SPSS.

Table 12 –Normality Tests

Tests	P-value
Kolmogorov-Smirnov Test	0,200
Shapiro-Wilk Test	0,048

The results are not conclusive, since considering the Kolmogorov-Smirnov Test, for confidence level of 95%, the null hypothesis, which states that the sample follows a normal distribution, is not rejected (p-value > 0.05) and using the Shapiro-Wilk Test the null hypothesis is rejected (p-value < 0.005)..

However, the normal distribution also depends of asymmetry coefficients, measured by skewness and kurtosis, which maybe around 0 and 3, respectively, and those two statistics have shown to be powerful and informative. (D'Agostino *et al.*, 1990)

The global financial literacy index presents a skewness of -0,11 and a Kurtosis of -0,92, so combining this statistics with the former normality tests, it is rejected the null hypothesis for a normal distribution.

So, for assessing the equality of the medians of Global Financial Literacy Index, taking into account its non-normal distribution, it was conducted the Kruskal-Wallis test, which is a non-parametric test used to test 2 or more groups with different dimensions. It follows approximately a χ^2 distribution with "n-1" degrees of freedom, being "n" the number of groups in each category.

Running the Kruskal-Wallis test at the SPSS program it is obtained the p-value test and the mean ranks.

The null hypothesis in every test means that the medians are statistically equals in the population groups in analysis. And, considering a confidence level of 95%, the null hypothesis is rejected since the p-value of the test is lesser than 0.05, meaning that the medians of population groups are statistically different.

Then it will be presented the statistical tests and its conclusions in relation to the hypothesis tests in study.

Hypothesis 1: "*Male small business owners present higher financial literacy levels than female gender.*"

- H_0: The medians of global financial literacy index for different genders are equal.
- H1: The medians are different.

According to Atkinson and Messy (2012), the male population presents higher levels of financial literacy. Nevertheless, the results by Banco de Portugal (2010), that tested this hypothesis for Portuguese population and Couto (2013) that tested this hypothesis for Portuguese entrepreneurs, conclude that financial literacy levels are not significantly different with respect to gender.

In the sample the male small business owners exhibits, on average, a higher financial literacy level but, for a confidence level of 95%, this difference is not statistically significant. This result follows the evidence found at literature for the similar tests done with Portuguese population (Table 13).

Table 13 – Hypothesis 1: "Male small business owners present higher financial literacy levels than female gender" – Kruskal-Wallis test

Category: Gender	Mean Ranks	P-value
Male	54,12	**0,262**
Female	46,40	

Hypothesis 2: "*Small business owners with higher education present higher financial literacy levels.*"

- H_0: The medians of global financial literacy index of small business owners with different education levels are equal.
- H_1: The medians are different.

Banco de Portugal (2010), at a national level, and Atkinson and Messy (2012), at a global level, stated that individuals with higher education levels exhibit a higher financial literacy level, despite Couto (2013) could not statistically prove that different among entrepreneurs.

At the present study, on average, the financial literacy levels increase with the degree of education, and for a confidential level of 95%, the small business owners with a higher education level have higher financial literacy (Table 14).

Table 14 – Hypothesis 2: "Small business owners with higher education present higher financial literacy levels." – Kruskal-Wallis test

Category: Education Level	Mean Ranks	P-value
Primary education	25,55	
Compulsory education	34,39	
12th year	52,51	**0,000001**
First degree	71,12	
Master degree or higher	82,00	

Hypothesis 3: "*Small business owners with education in/or related with economics present higher financial literacy levels.*"

- H_0: The medians of global financial literacy index of small business owners with education in/or related with economics are equal.
- H_1: The medians are different.

In relation to the third study hypothesis, Portuguese entrepreneurs with education related with economics demonstrated to have higher financial literacy levels (Couto, 2013).

The present study also showed, on average, a higher financial literacy levels among small business owners with education related with economics compared with those without. Despite this expected result, which shows that more education, specially focused on economics, reflects in higher levels of financial literacy, it was possible to prove statistically, for a confidence level of 95%, the rejection of null hypothesis.

Table 15 – Hypothesis 3: "Small business owners with education in/or related with economics present higher financial literacy levels" – Kruskal-Wallis test

Category: Education in Economics	Mean Ranks	P-value
Education in economics	79,11	**0,003**
No education in economics	48,83	

Hypothesis 4: "Younger *small business owners present lower financial literacy levels.*"

- H_0: The medians of global financial literacy index of small business owners of different ages are equal.
- H_1: The medians are different.

The literature concerned with financial literacy for personal finance issues indicates that the population between 30 - 60 years old exhibits a higher level of financial literacy (Atkinson and Messy, 2012).

At the present study, despite, on average, small business owners of intermediate age groups (45 to 54 years old) showed a higher financial literacy level, it is not possible to reject the null hypothesis of this fourth study hypothesis (p-value > 0.05). Also Couto (2013) could not find statistical significance in this specific test and that could be explained because the population target in a business context is not as younger as the population target for the studies of financial literacy for personal finance issues. In this last studies, the younger's respondents have 18 years old and at the present work the younger small business owner has 27 years old and the sample has a higher concentration of individuals at the age group between 35 and 44 years old (Table 16).

Table 16 – Hypothesis 4:" Younger small business owners present lower financial literacy levels" – Kruskal-Wallis test

Category: Business Owner Age	Mean Ranks	P-value
26 – 34 years	55,18	
35 – 44 years	50,27	
45 – 54 years	58,46	**0,187**
55 – 65 years	50,00	
Over 65 years	15,33	

Hypothesis 5: "*The financial literacy levels of small business owners are higher in bigger firms.*"

The company dimension of the present study hypothesis is measured by the amount of revenue in 2014 and the entire sample was not included for this specific test, excluding the sole proprietorship businesses because their financial statements are not available at SABI.

- H_0: The medians of global financial literacy index of small business owners from companies with different sizes are equal.
- H_1: The medians are different.

On the referred sample, which excludes the sole proprietorship businesses, on average the financial literacy levels increases with the size of the company and those differences between the revenue categories presented at the below table are statistically significant, for a confidence level of 95%.

With this result it is possible to state that the needs for financial education are concentrated in the owners of smaller companies (Table 17).

Table 17 - Hypothesis 5: "The financial literacy levels of small business owners are higher in bigger firms." – Kruskal-Wallis test

Category Revenue	Mean Ranks	P-value
Until 10.000€	2,50	
Between 10.001 and 100.000€	29,61	
Between 100.001 and 500.000€	45,06	**0,0004**
Between 500.001 and 2.000.000€	55,25	
Over 2.000.000€	73,42	

Hypothesis 6: "*Small business owners responsible for companies' financial area present higher financial literacy levels than those who trust the financial area to accountants.*"

- H_0: The medians of global financial literacy index of small business owners responsible or not for financial area are equal.
- H_1: The medians are different.

At the literature was found as a common practice the trust of financial area to accountants (Brown et al., 2006).

The test results exhibit a difference statistically significant between the financial literacy levels of small business owners who are responsible for their financial area and those who trust this area to their accounts. As a result, the needs for financial education should rely on business owners who are not liable for their companies' financial area since they present lower levels of financial literacy (Table 18).

**Table 18 - Hypothesis 6: "Small business owners responsible for companies'
financial area present higher financial literacy levels than those who trust the
financial area to accountants." – Kruskal-Wallis test**

Category : Financial Area Responsible	Mean Ranks	P-value
Business Owner	54,75	
Accountant	39,04	**0,007**
Financial Department	72,17	

Hypothesis 7: *"There is a positive relation between the financial literacy levels of
small business owners and the performance of their firms."*

- H_0: The medians of global financial literacy index of small business owners with
  a positive or a negative ROA are equal.
- H_1: The medians are different.

The results (Table 19) highlight a positive relation between financial literacy levels and
firms' performance, measured by ROA, which statistically evidence a higher
concentration of low levels of financial literacy among entrepreneurs whose firms have
a negative or null ROA.

**Table 19 – Hypothesis 7: *"There is a positive relation between the financial literacy
levels of small business owners and the performance of their firms"* – Kruskal-Wallis
test**

Category :Firms' Performance	Mean Ranks	P-value
ROA negative or null	21.63	
ROA positive	54,62	**0,00000002**

The results exhibit that in all study hypothesis was possible to prove the difference between the medians of respondents' characteristics, except for gender and groups of age. The hypothesis 7 result strengthens the needs for study the relation between financial literacy levels and firms' operating performance, measured by ROA as proxy.

5.3 Operating Performance Results

In this section is exhibited the statistical analysis and results of the adapted operation performance model described at Methodology chapter. As already referred the entire sample was not included for this part of the study, excluding the sole proprietorship businesses because their financial statements are not available at SABI, so instead of a sample of 103 companies, it was used a sample of 88 companies.

Table 20 - Descriptive Statistics

Variable	N	Mean	Std Dev	Min.	Median	Max.
ROA	88	-0,050	0,065	-3,204	0,042	1,894
ROE	87	-0,197	0,228	-18,023	0,034	6,331
LEV	88	1,343	0,365	0,043	0,602	118,2
LNTA	88	12,143	0,165	8,474	12,179	15,691

The Table 20 presents descriptive statistics for dependent and independent variables of the operating performance model.

The ROE (return on equity) was introduced as a independent variable because this variable was also used in former studies as a measured of operating performance, according to the literature, but not as the preferred one.

The mean of ROA is negative of -5% (median 4.2%). The mean of ROE is smaller, with -20% (median 3.4%), and also has one less observation because the sample has an outlier with a huge impact at results. The leverage mean is very high about 134% (median 60%), which can be justified by the existence of some companies in the sample technically bankrupt (18%).

Table 21 – Pearson correlation coefficients

	ROA	*ROE*	*RATING_FLI*	*LEV*	*LNTA*
ROA	1,000				
ROE[1]	0,435	1,000			
RATING_FLI	0,433	0,131	1,000		
LEV	-0,750	-0,025	-0,321	1,000	
LNTA	0,348	0,172	0,489	-0,373	1,000

The Table 21 presents the Pearson correlation coefficients between the dependent and independent variables of the operating performance model.

The dependent variable ROA is positively correlated with RATING_FLI, as well as the dependent variable ROE, although less correlated with the this independent variable.

Only the correlation of ROA and RATING_FLI is statistically significant. The highest absolute value of the correlations among the independent variables is 0.75, which is indicative that the regression results might not be affected by multicollinearity.

According to Pearl and Eileen (2014), the financial difficulties of small business owners fall into three categories: loss of revenues, insufficient cash-flow, and excessive debt. Generally, in most companies the loss of revenue is related with the economy recession, which, of course, is not controllable by business owners. However, insufficient cash flow and excessive debt are both areas that small business owners can manage, given sufficient Financial Literacy.

In the sample of the present work, excluding sole proprietorship businesses, 31% have negative ROA in 2014, however only 37% were experiencing historical losses of revenue, in the last 3 years, on average higher than 5% per year.

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[1]ROE: Return on Equity for firm i, and is measured by the net income divided by the book value of stockholders' equity

And, the majority of the referred sample (58%) has excess of debt, with a leverage ratio higher than 50%, however only 27% of those companies were facing historical losses of revenue, in last 3 years, on average higher than 5% per year, which means that the remaining 73% companies with excess of debt and the remaining 63% with negative ROA can possibly improve it with appropriate financial education.

Table 22 reports two columns of results of the OLS regression analysis, using as the independent variable the ROA, the first with the inclusion of 12 variables dummies for industry activity and the other without the inclusion. The ROE was not included due to its non-statistically significant correlation with the dependent variable RATING_FLI according to Pearson correlation coefficients.

Table 22 – Results of OLS Regression of Adapted Operating Performance Model

Variable	ROA Coefficient estimate (t-statistic)	
Intercept	**-0.226** **(-0.433)**	-0.144 (-0.395)
RATING_FLI	**0.103**** **(2,308)**	0.118*** (2.755)
LEV	**-0.110**** **(-8.124)**	-0.121*** (-9.131)
LNTA	**-0.004** **(-0.133)**	-0.006 (-0.192)
Industry dummies	**Included**	-
R^2	**71.3%**	60.4%
Adjusted R^2	**65.3%**	59%
Std Deviation	**0.36**	0.39
N	**88**	88
Degrees Freedom	**72**	84

Note: ** and *** denote statistical significance at the 5% and 1% level respectively. Results on the industry dummies are not reported for parsimony.

At both regressions, the variables RATING and LEV are statistically significant. The exception is in the variable LNTA, although it was also regressed this model replacing this variable by the total assets of firms and the results also did not evidence statistical significance.

The doubt of whether or not include the dummy variables for industry activity was solved by the F test of quality improvement of the adjustment (Table 23), with the following hypothesis tests.

H_o: Coefficients associated to the 12 dummies all simultaneously equal to zero.

H_1: At least one is different of zero.

Table 23 – Quality Improvement of the Adjustment – F test

F_{obs}	F_{crit}
2.28	1.92

For a confidence level of 95%, is rejected H_o ($F_{obs} > F_{crit}$), which allow to conclude that the introduction of the 12 industry dummies significantly contributes for the quality improvement of the adjustment

The regression of the adapted model (Table 22, column 1) exhibit a good explanatory power, with an adjusted R-squared of 65%, and the independent variable, RATING_FLI, has a positive relation with the ROA, also statistically significant, for a confidence level of 95%.

These results evidence that a higher financial literacy level of small business owners contribute for a better performance of their firms, alongside with the rather low financial literacy level of entrepreneurs found at this research, this increases the need for financial education.

6. Conclusions

This research has twofold objective: to assess financial literacy levels of small business owners of the North of Portugal and correlate this results with the performance of their firms.

In order to achieve the first goal was used a questionnaire methodology, similarly to the major works developed so far for personal finance issues. Being the questionnaire (Appendix A) composed by four major areas: respondent characteristics; financial knowledge, financial behavior and financial attitudes. The last three components provide from financial literacy definition world widely accepted (Atkinson and Messy, 2012).

The second goal was achieved through the adaptation of the operating performance model of Bauwhede (2009).

The sample used to assess the financial literacy level sum 103 respondents, a number that ensures its representativeness, and they where mainly from Porto region, following the distribution of firms across the North of the country.

The results evidence that small business owners tend to overestimate their capacities, since only 11% admitted to have a rather low level of financial literacy, when the results exhibited to be four times higher in number of small business owners in this situation. Also it showed that small business owners have the right attitude towards financial matters, however their financial behavior does not follow this trend.

The lower financial literacy levels are associated with firms with null or negative ROA, measure used as a proxy for firms' performance. This result strengthened the need for a deeper analyze of the relation between financial literacy levels of small business owners and their firms' performance.

The regression of the adapted model using exhibits a positive correlation between financial literacy rating and ROA, with statistical significance.

This allows to conclude that a higher financial literacy level of small business owners contribute for a better performance of their firms. And, alongside, with the rather low financial literacy level of entrepreneurs found at this research, this strengthens the needs for financial education for this specific public.

The major contributes of the present research are the improvements at evaluation methodology in assess the financial literacy levels among small business owners; study for the first time the relation between financial literacy levels and firms' performance, and, considering the evidence of a positive relation between this two variables, aware for the needs of adequate financial education for small business owners on the expectation of improving their performance as business leaders.

With an adequate program of financial education is expected an improvement of financial literacy levels, a reduction of the risk of small business owners experience financial difficulties due controllable factors, like excessive debt, and minimize the number of small business owners that are mere employees of their companies to become business leaders.

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Appendix A - Questionnaire

(English Version)

Respondents Characteristics

1. Respodent's Name

2. Business Fiscal Number

3. Respondent's Gender

Male

Female

4. Age

5. Education Level

Primary School

Compulsory Education - 9th year

12th year

First Degree

Master Degree or higher

6. Do you have specific formation at financial area?

Yes

No

7. If you respond yes to the question 6, please describe de type of formation.

8. Are you the main responsible for the financial area of your company?

Yes

No

9. If not, to whom or to what is trusted the financial responsibility?

Accountant

Financial Department

Outsourcing

Other

10. On a scale of 1 to 5, where 1 is bad and 5 is very good, what do you consider to be your level of financial literacy? (Financial literacy is a combination of awareness, knowledge, skills, attitudes and behavior needed to make sound financial decisions, in order to achieve individual financial well-being.)

1 Bad

2

3

4

5 Very good

Financial Knowledge

11. Imagine that you have to wait a year to receive a VAT refund of 5.000€. In one year's time will you be able to buy/spend:

More

The same amount

Less than I could buy today

Don't know

12. Suppose you put €100 into a savings account with a guaranteed interest rate of 2% per year. You don't make any further payments into this account and you don't withdraw any money. How much would be in the account at the end of the first year, once the interest payment is made?

[Open answer]

13. And how much would be in the account at the end of five years? Would it be:

More than €110

Exactly €110

Less than €110

It is impossible to tell from the information give

Don't know

14.High inflation means that the cost of living is increasing rapidly?

True

False

Don't know

15. It is usually possible to reduce the risk of investing in the stock market by buying a wide range of stocks and shares.

True

False

Don't know

16. A company has more cash today when:

Costumers pay their bills sooner

Profit increases

Accounts receivable increases

Retained earnings increases

Don't know

17. EBITDA is an important measure in companies because:

It is free cash flow

It subtracts taxes and depreciations from earnings to get a truer picture of the business

It is an indicator of future operating cash flow

It is the key measure of earnings before interest, transfers and debt reduction

Don't know

18. The best description of information provided on a Balance Sheet is:

A list of what you own and what you owe

Fluctuations of assets over a certain period of time

Number of employees the company has

All of the above

Don't know

19. What financial statement most accurately shows whether a company was profitable in a given period?

Statement of Cash Flows

Balance Sheet

Income Statement

Statement of Financial Position

Don't know

Financial Behavior & Financial Attitudes

20. On a scale of 1 to 5, where 1 is nothing important and 5 very important, the preparation of a business plan at the beginning of the activity is?

1 Nothing important

2

3

4

5 Very important

21. Was the business plan made at beginning of your activity?

Yes

No

22. Facing the need for an investment, do you consider important the business plan update (or elaboration)?

1 Nothing important

2

3

4

5 Very important

23. Do you know how to make a cash flow forecast?

Yes

No

24. In your company, how often it is prepared a cash flow forecast?

Never

Once a year

At least every six months

At least every single month

25. Do you consider important the periodic analysis of company's profitability, in order to minimize costs and maximize profits?

1 Nothing important

2

3

4

5 Very important

26.How often do you it?

Never

Once a year

At least every six months

At least every single month

27.If you have a bank loan, do you monitor its credit conditions and compare them with existing alternatives?

No

Yes, whenever I have difficulty in paying some responsibility

Yes, once a year

Yes, at least every six months

28.If you have a bank loan, do you renegotiates its credit conditions?

No

Yes, whenever I have difficulty in paying some responsibility

Yes, once a year

Yes, at least every six months

(Versão Portuguesa)

Características dos Entrevistados

1. Nome

2. N.I.F. – Número de Identificação Fiscal (da empresa)

3. Género

| Masculino |

| Feminino |

4. Idade

5. Nível de Escolaridade

| Ensino Primário |

| Ensino Obrigatório – 9º ano |

| Ensino Secundário – 12º ano |

| Licenciatura |

| Mestrado ou grau superior |

6. Tem alguma formação específica na área financeira?

| Sim |

| Não |

7. **Se sim, por favor descreva o tipo de formação.**

8. É o(a) responsável pela área financeira da empresa?

Sim

Não

9. Se não, em quem confia a gestão da área financeira da sua empresa?

Contabilista

Departamento Financeiro

Subcontrata

Outro

10. Numa escala de 1 a 5, em que 1 é mau e 5 muito bom, qual considera ser o seu grau de literacia financeira? (Literacia Financeira é a combinação de consciência, conhecimento, habilidade, atitude e comportamento necessários para tomar decisões financeiras sólidas e alcançar o bem-estar financeiro individual.)

1 Mau

2

3

4

5 Muito Bom

Conhecimento Financeiro

11. Imagine que tem de esperar um ano para obter o reembolso de IVA no montante de 5.000€. Daqui a um ano será capaz de comprar:

Mais

O mesmo montante

Menos do que poderia comprar hoje

Não sei

12. **Suponha que coloca 100€ numa conta poupança com uma taxa de juro garantida de 2% ao ano. Não faz nenhum aumento de capital nesta conta e também não procede a qualquer resgate. Quanto é que deverá ter na conta ao fim de um ano?**

[Resposta Aberta]

13. **E quanto é que deveria de estar na conta poupança ao fim de 5 anos? Seria:**

Mais de €110

Exactamente €110

Menos de €110

É impossível saber a partir das informações dadas

Não sei

14. **Elevada inflação significa que o custo de vida está a aumentar rapidamente?**

Verdadeiro

Falso

Não sei

15. **Normalmente é possível reduzir o risco de investir no mercado de ações através da compra de uma ampla gama de ações.**

Verdadeiro

Falso

Não sei

16. **Uma empresa tem mais dinheiro hoje quando:**

Os clientes pagam mais cedo

O lucro aumenta

A conta de clientes aumenta

Os resultados transitados aumentam

Não sei

17. O EBITDA é uma importante ferramenta para as empresas porque:

Representa o fluxo de caixa livre

Ao lucro é-lhe subtraído impostos e depreciações para obter uma imagem verdadeira do negócio

É um indicador de fluxo de caixa operacional futuro

É a principal medida de lucro antes de juros e redução da dívida

Não sei

18. Qual a melhor descrição da informação fornecida no Balanço?

Uma lista do que a empresa possui e do que deve

Flutuações dos ativos ao longo de um determinado período de tempo

Número de empregados que a empresa tem

Todas as acima

Não sei

19. Qual a demonstração financeira que mostra de forma mais precisa se uma empresa se apresentou rentável num determinado período de tempo?

Demonstração de Fluxo de Caixa

Balanço

Demonstração de Resultados

Mapa de Origem e Aplicação de Fundos

Não sei

Atitudes e Comportamentos Financeiros

20. Numa escala de 1 a 5, em que 1 é nada importante e 5 muito importante, a elaboração do plano de negócios no início da atividade é?

| 1 Nada importante |
| 2 |
| 3 |
| 4 |
| 5 Muito importante |

21. Foi realizado um plano de negócios no início da atividade?

| Sim |
| Não |

22. Perante a necessidade de realizar um investimento, considera importante a atualização (ou a elaboração) do plano de negócios?

| 1 Nada importante |
| 2 |
| 3 |
| 4 |
| 5 Muito importante |

23. Sabe como se elabora um mapa previsional de fluxo de caixa?

| Sim |
| Não |

24. Com que frequência elabora na sua empresa o mapa previsional de fluxo de caixa?

Nunca

Uma vez por ano

Pelo menos semestralmente

Pelo menos mensalmente

25. Considera importante a análise periódica da evolução da rentabilidade da sua empresa, por forma a minimizar custos e maximizar proveitos?

1 Nada importante

2

3

4

5 Muito importante

26. **Com que frequência o faz?**

Nunca

Uma vez por ano

Pelo menos semestralmente

Pelo menos mensalmente

27. No caso de recorrer a crédito bancário, acompanha as suas condições e compara-as com as alternativas existentes?

Não

Sim, sempre que possuo dificuldades em pagar alguma responsabilidade

Sim, uma vez por ano

Sim, pelo menos semestralmente

28. No caso de recorrer a crédito bancário, renegoceia as suas condições?

Não

Sim, sempre que possuo dificuldades em pagar alguma responsabilidade

Sim, uma vez por ano

Sim, pelo menos semestralmente