GESTIÓN SOCIAL

ORGANIZACIONES HUMANAS PARA UNA SOCIEDAD GLOBAL INCLUYENTE

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ÍNDICE

Determinants of return on assets and capital structure - disparities depending on the region and the certified accountant

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Abstract

Focused on a population that represents the majority of Portuguese business fabric – the SME's and a sample of SME's located on the interior of mainland Portugal, this paper raises the research question: "The region where the firm operates, as well as its Certified Accountant (TOC), influences its Return on Assets (ROA)?" Based on pecking order theory and static trade off theory as well as the determinants indicated by them to explain the ROA, we applied a multivariate linear regression analysis to identify such factors on a unique private database of companies' financial data collected s for the period 2006 to 2009 with 4096 observations. Along with traditional factors we also tested the region and TOC responsible for SME's books. The results indicate that all the independent variables included in the multiple regression linear model, have a negative coefficient, with the exception of the capital structure, financial expenses, return on turnover, location of companies and TOC responsible for accounting. These variables are statistically significant at 5% significance level (except the variable TOC). There seems to exist differences between companies in its profitability due to the TOC that is responsible for accounting.

Keywords: Return on Assets, Certified Accountants and interior regions.

Introduction

Since the publication of Modigliani and Miller (1958) seminal papers that studies on the capital structure of companies have multiplied but these focus mainly on large companies or in listed ones. But in Portugal, as in most countries, large and listed companies represent a small percentage of all the companies operating in the economy. The Portuguese business fabric is dominated by Small and Medium Enterprises (SMEs), i.e. by companies that have fewer than 250 employees (and a

turnover below 50 million or total assets less than 43 million Euros[1]), and more than 95% are less than 10 employees (INE, 2015). The researches that have been developed seek to explain the decision by the firms about its financing/ debt policies and the choice of its capital structure (i.e. the mix of equity and debt), focusing on most common capital structure theories: the Pecking Order theory (POT); the Tradeoff theory (TOT) or the Market timing theory. They take into account factors such as asymmetric information, agency costs and the tax effect, and often as determinants the leverage ratio, profitability, growth opportunities and (tangible) assets.

This paper raises the question of research: "The region where the firm operates, as well as its Certified Accountant (TOC), influences its Return on Assets (ROA)?". Throughout the work we will try to answer to this question, in the light of existing theories (mainly based on POT and TOT), identifying the determinants of return considering the factors that are suggested by the aforementioned theories, without resorting to a single theory. It focuses on a population that represents the majority of Portuguese business community, mainly SMEs located in the interior of Portugal. It apply the methodology of multiple linear regression to identify factors that better explain the profitability of these companies, using a unique private database of companies' financial data collected for the time frame 2006-2009.

This paper is divided into three sections, besides this introduction and conclusions. In the following section is made brief and succinct framework on capital structure theories. The determinants of the capital structure are listed and the research about the capital structure and its determinants in SMEs, at national and international level. Then, in Section 3, is described the methodological procedures to be applied in the empirical analysis (definition of objectives, assumptions and variables, as well as the sample and the period of analysis). On this point is also conducted a brief description of the region where the companies in the sample are inserted. Section 4 proceeds to the characterization of the sample, with some descriptive statistics concerning the

[1] Classification according to Decree-Law No. 372/2007 of November, 6, revised by Decree-Law No. 143/2009 of June, 16 and Recommendation No. 2003/361/EC of the European Commission of May, 6.

distribution of the companies in the study, as the sector of activity and size measured by number of employees, turnover and total assets as well as indicators profitability - return on total net assets. It is concerning to analyse the possible influence of the region and the TOC in corporate profitability. Then presents and discusses the results of the multivariate linear regression and test the hypotheses previously formulated. Finally, it exposes the main conclusions, limitations and suggestions for future research.

Theories and determinants of the capital structure

The capital structure is a strategic financial decision of companies involving its financing policy and the mix of capital that finances its assets. Several theories have been proposed to explain the firms' capital structure after the publication of Modigliani and Miller´s work (MM) in 1958, corrected in 1963 (Modigliani & Miller, 1963). MM claimed that there is not an optimal capital structure as was supported by Durand (1952) and (Schwartz, 1959).The most popular theories are the Pecking Order theory (Myers and Majluf, 1984) and the static Trade Off theory (DeAngelo & Masulis, 1980; Miller, 1977).

Static Trade off theory holds that each company has an optimal capital structure that results from the balance between the use of debt (debt target ratio) and tax benefits and other face to bankruptcy and other costs (such as agency costs) (Kraus & Litzenberger, 1973; Bie & Haan, 2007; Charalambakis & Psychoyios, 2012). The Pecking Order theory advocates that companies prioritize different sources of capital giving preference to the self-financing since the information asymmetry increases financing costs (Myers, 1977; Myers & Majluf, 1984; Helwege & Liang, 1996; López-Gracia & Sogorb-Mira, 2008; Serrasqueiro, Armada, & Nunes, 2011). As regards Bie and Haan (2007), the choice of financing sources are driven by adverse selection costs resulting from information asymmetry between managers (more informed) and investors (uninformed). Vast literature has sought to validate these theories in different markets and industry sectors as well as firms of different sizes (v. g. Vogt, 1994; de Miguel & Pindado, 2001; Graham & Harvey, 2001; Sogorb-Mira, 2005; López-Gracia & Sogorb-Mira, 2008; Vasiliou & Daskalakis, 2009; Serrasqueiro,

Nunes, Leitao, & Armada, 2010; Vieira & Novo, 2010; Serrasqueiro et al., 2011; Dong, Loncarski, Horst, & Veld, 2012a; Alves, Couto, & Francisco, 2015; Kakilli, 2015).

Another theory that attempts to explain the management decision in the choice of firms' capital structure is the market timing theory or the theory of synchronization of the market, presented initially by Baker and Wurgler (2002). This theory holds that companies issue new shares or resort to monetary and bond market to issue debt when the market is high and buy back shares when the market is down, corresponding respectively to the periods in which the cost of capital is at low or high.

This is possibly the least studied theories and was essentially applied to listed companies in the U.S. and the UK (Bie & Haan, 2007), or in new shares issues of firms that become public (IPO – Initial public Offerings) or in the issuance of shares of firms already established in the market (SEO - Seasoned Equity Offering) (Kaya, 2014). More recently have been published research which seek to validate this theory in different markets (v. g. Bie & Haan, 2007; Çelik & Akarim, 2012; Chen, Chen, Chen, & Huang, 2013; Dong et al., 2012b; Hovakimian, Opler, & Titman, 2001; Kaya, 2014; Vasiliou & Daskalakis, 2009; Wong, 2015).

Associated with each theory have been tested some determinants that aim to justify the capital structure and the related decisions. One of the first studies that attempt to identify the factors that determine the firms' capital structure was from Titman and Wessels (1988), followed by others like Frank and Goyal (2009) and Guo and Suliman (2010). These studied factors such as liquidity, profitability, non-debt tax shields, the singularity of products, among others. Other studies looked beyond firms' own characteristic factors, those related to the characteristics of the markets where they operate (economies more oriented to market or economies more dependent on banking) (Antoniou, Guney, & Paudyal, 2008; Acedo-Ramirez & Ruiz-Cabestre, 2014) or industry (Leary & Roberts, 2014). There are still to refer to research that have been performed on SMEs and unlisted companies or family firms (v. g. Islam & Khandaker, 2015; Joeveer, 2013; López-Gracia & Sogorb-Mira, 2008; Mac an Bhaird & Lucey, 2010; Michaelas, Chittenden, & Poutziouris, 1999; Serrasqueiro & Nunes, 2008).

Some of these researches have analysed factors influencing the capital structure of SMEs, such as the tangibility of assets; profitability; growth opportunities and the level of debt (Kebewar & Shah, 2013; Proença, Laureano & Laureano, 2014). The results obtained do not always coincide.

Research methodology

Characterization of Interior Region of Mainland Portugal

With the entry into force of Decree-Law No. 244/2002 of 5 November, Portugal was divided in NUTS - Nomenclature of Territorial Units for statistical purposes, which are appropriate to the current socio-economic profile of the region. This division began in 1986 with the objective of standardizing the collection of statistical information within the EU (Claudino, 2006). Claudino (2006, p.106) considers that "the regional construction ambiguity of Portuguese mainland territory has its roots in the absence of a clear geographical demarcation regions and own historical evolution of the regional process".

In terms of market concentration, it is clear the supremacy of the number of companies which can be seen in coastal compared to the inland. To highlight, there are in the centre of the country, a number of regions, all contiguous, with a very small number of firms. The political power, with the publication of Law No. 171/99 of 18 September, tried to combat this, however, these measures have not been effective, or if have succeed, have not yet been felt, as stated by some researches (Fernandes, 2013; Sequeira & Sá, 2008). The interior region of mainland Portugal has only 16.48% of all companies at the national level, and SMEs account for 99.76% (echelons up to 250 persons) of all companies at the national level and 99, 90% in the interior region. According to data published by Pordata, for the year 2009, presented in Table 1, of the 1198781 existing companies[2] in Portugal, 95.87% have fewer than 10 employees at its service, being one significant indicator of the importance of the group of micro-enterprises in the Portuguese business fabric.

[2] In this table, with the objective of characterizing the Portuguese business fabric it was considered all domestic companies, irrespective of their legal structure.

Table 1 - Non-financial companies by total and by size (number of employees)

		Number of employees in year 2009				
	Total	**<10**	**10-19**	**20-49**	**50-249**	**250+**
Portugal (unit)	1.198.781	1.149.325	28.225	14.365	5.970	896
Portugal (%)	100%	95,87%	2,35%	1,20%	0,50%	0,07%
Interior region (unit)	228473	220924	4704	2075	704	63
Interior region (%)	100%	96,70%	2,06%	0,91%	0,31%	0,03%
Int. Reg./Portugal (%)	19,06%	19,22%	16,67%	14,44%	11,79%	7,03%

Source: Own elaboration, based on data available in www.pordata.pt on 07/20/2013.

The heterogeneity between the coast and the Interior region happens not just in economic activity. The distribution of Potential Sustainability Index[3] follows the same behaviour. This indicator has declined in Portugal in recent decades. In 1971 it was 6.4 and in 2001 was 4.1, rising to 3.7 in 2009 and 3.4 in 2011. The worsening of this phenomenon is common and widespread throughout the territory. In 2001 there were 58 municipalities, whose sustainability index was less than or equal to 2.3. In 2011, the number of municipalities in this situation rises to 98 (INE, 2011). In 2011, Alcoutim, Penamacor, Vila Velha de Rodão and Idanha-a-Nova have the lowest indicator (1.1) which means that about one active for each individual aged 65 or more years. The municipalities of mainland Portugal, with higher rates are located in the north of the country: Paredes with 6.7; Vizela with 6.8; Paços de Ferreira with 7.0; and Lousada with 7.1(INE, 2011).

With regard to the surface of the territory, by geographical location, the interior of mainland Portugal has frankly superior values to the country's coastline, being

[3] The ratio between the working-age population and the elderly population, normally defined as the quotient between the number of people aged between 15 and 64 years and the number of people aged 65 and over (usually expressed as 100 (10^2) people aged 65 and over) (INE, 2011).

considered within 72.19% of the entire national territory. This indicator in conjunction with the concentration of people and businesses on the coast makes the population density by place of residence matches, in the interior, only 43.47% of the same indicator at the national level. The crude birth rate, by place of residence, the crude death rate by place of residence and the aging index[4] by place of residence are unfavourable indicators for the interior region. In other words, Portugal has a crude birth rate by place of residence, very close to the crude death rate by place of residence. However, the latter is slightly higher. Nevertheless, there are municipalities within the country that have values well below the national average, as is the case of Torre de Moncorvo with a crude birth rate of 2.7 ‰ and a crude death rate of 14.3 ‰. Despite this municipality has the lowest birth rate is not the one with the biggest difference between the two crude rates. The Vila Velha de Ródão municipality in the Castelo Branco district has a crude birth rate of 3 ‰ and a crude rate of mortality of 29 ‰, representing highest aging index by place of residence in the country: 540, 1.
In table 2 we can observe an aging index by place of residence in interior region close to double of that at national level, as a result of the supremacy of the crude death rate on the crude birth rate.

Table 2 - Indicators of the Portuguese population

	Crude birth rate by place of residence (‰)	**Crude death rate by place of residence** (‰)	**Aging index by place of residence** (No.)
Portugal	9,4	9,9	119,3
Interior Region	6,66	24,66	220,29

Source: Own elaboration, based on data available in www.pordata.pt on 07/20/2013.

[4] The ratio of the number of elderly persons of an age when they are generally economically inactive (aged 65 and over) to the number of young persons (from 0 to 14) (INE, 2011).

After describing the entire region interior of Portugal, the following indicators are divided by NUTS III that will be studied in this paper in order to better understand the composition of the sample in the population. The interior regions of mainland Portugal that will be considered in this paper and according to NUTS III are: Douro, Alto Trás-os-Montes, Cova da Beira, Beira Interior Norte, Ave, Dão-Lafões, Beira Interior Sul and Tâmega.

One of the analysed indicators is the gross amount in cash and / or in kind, paid to employees for the time worked or work done in normal and extraordinary periods. As can be seen in Table 3, this indicator recorded a positive average annual increase of 3.3%. Somehow becomes surprising that this increase in some regions as Beira Interior Sul, Dão-Lafões, Douro, and Tâmega, is higher than the national average. However, the remaining regions, with the exception of Beira Interior Norte, have values slightly below the national average. The only region with a negative average annual change remains the Ave region. Even with regard to the average earnings in monetary terms, the regions under analysis have values below the national average. This difference is very similar in the two years under review, 2004 and 2009, ranging, in 2009, between 69.81% for the region of Tâmega and 82.09% for the Dão-Lafões region. One cause for this difference may be in the size of the entrepreneurial fabric of the interior region. As shown by the analysis in Table 1, in the interior the number of companies with over 250 persons employed is reduced and those companies practice the highest salaries to the senior job levels (managers and company boards). Another reason may be related to the fact that there are few senior managers working in the interior regions, because the vast majority of firms are micro or small business, not having the financial capacity to support senior managers on its staff.

Table 3 - Average monthly earnings by geographic location

NUTS III	2004	2009	Annual Average Change
Portugal	877,50 €	1.034,20 €	3,34%
Alto Trás-os-Montes	649,50 €	764,70 €	3,32%
Alto Trás-os-Montes/Portugal	*74,02%*	*73,94%*	
Ave	798,40 €	666,90 €	-3,54%
Ave/Portugal	*90,99%*	*64,48%*	
Beira Interior Norte	678,20 €	781,00 €	2,86%
Beira Interior Norte/Portugal	*77,29%*	*75,52%*	
Beira Interior Sul	704,40 €	836,30 €	3,49%
Beira Interior Sul/Portugal	*80,27%*	*80,86%*	
Cova da Beira	663,80 €	780,90 €	3,30%
Cova da Beira/Portugal	*75,65%*	*75,51%*	
Dão-Lafões	706,60 €	849,00 €	3,74%
Dão-Lafões/Portugal	*80,52%*	*82,09%*	
Douro	678,70 €	806,40 €	3,51%
Douro/Portugal	*77,34%*	*77,97%*	
Tâmega	586,10 €	722,00 €	4,26%
Tâmega/Portugal	*66,79%*	*69,81%*	

Source: Own elaboration, based on data available in www.ine.pt

Table 4 shows the number of students enrolled in secondary education by the resident population aged between 15 and 17 years in Portugal. There was a positive average annual growth rate of about 5.2% from 2004 to 2010. The Ave region is the only one that recorded a negative average annual change of 5.1%. All other regions had average positive annual change, with particular emphasis on the regions of Beira Interior Sul and Tamega that showed average annual change significantly above the

national average. Note also that the eight regions under analysis, the Tamega is the region where the indicator is lower, coming in the years 2004/2005, 2005/2006 and 2006/2007, young people aged 15 to 17 years, to be greater in number than the students enrolled in secondary education, which presented the highest average annual growth rate.

Table 4 - Gross enrolment rate in secondary education by geographical location

NUTS III	academic year						Annual Average Change
	04/05	05/06	06/07	07/08	08/09	09/10	
Portugal (%)	107,6%	99,5%	102,3%	101,0%	146,7%	146,2%	5,2%
Alto Trás-os-Montes (%)	102,8%	93,4%	102,0%	108,6%	193,4%	158,4%	7,5%
Ave (%)	114,3%	122,9%	121,9%	87,9%	85,6%	83,3%	-5,1%
Beira Interior Norte (%)	110,5%	106,0%	101,9%	100,5%	161,3%	157,5%	6,1%
Beira Interior Sul (%)	136,8%	131,3%	129,8%	115,2%	243,8%	229,1%	9,0%
Cova da Beira (%)	112,4%	107,3%	106,5%	102,7%	168,6%	156,2%	5,6%
Dão-Lafões (%)	109,1%	99,8%	107,2%	99,9%	137,0%	141,6%	4,4%
Douro (%)	102,2%	93,0%	96,3%	103,6%	165,3%	159,9%	7,7%
Tâmega (%)	64,9%	60,0%	63,2%	63,6%	102,7%	110,7%	9,3%

Source: Own elaboration, based on data available in www.ine.pt

Finally, in Table 5, it is found that the weight that each of the regions under analysis has to national Gross Domestic Product (GDP) is very low. In 2009 only two regions account for 44.18% of national GDP: the Grande Porto represents 12.21% and the Grande Lisboa 31.97%.

Table 5 - Gross Domestic Product (GDP) by NUTS III (at current prices)

NUTS III	years							
	1995	1997	1999	2001	2003	2005	2007	2009
Portugal	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %	100,00 %
Alto Trás-os-Montes	1,35%	1,26%	1,25%	1,27%	1,25%	1,32%	1,30%	1,37%
Ave	3,94%	3,89%	3,86%	3,81%	3,72%	3,55%	3,54%	3,52%
Beira Interior Norte	0,69%	0,66%	0,67%	0,74%	0,71%	0,70%	0,69%	0,69%
Beira Interior Sul	0,68%	0,65%	0,62%	0,62%	0,61%	0,61%	0,60%	0,59%
Cova da Beira	0,61%	0,60%	0,59%	0,58%	0,56%	0,58%	0,57%	0,57%
Dão-Lafões	1,82%	1,86%	1,91%	1,96%	1,96%	1,97%	1,98%	1,97%
Douro	1,28%	1,21%	1,17%	1,22%	1,19%	1,22%	1,21%	1,30%
Tâmega	2,65%	2,64%	2,68%	2,76%	2,74%	2,74%	2,87%	2,90%

Source: Own elaboration, based on data available in www.ine.pt

In terms of GDP growth in the period 1995-2000, the domestic GDP showed a positive annual average change of 7.7%, observing in the following 5-year period a positive annual average change of 3.92%, and in the period 2005-2010 the average annual positive change of 2.3%. The analysed regions showed a similar growth, with the exception of Beira Interior Norte, that in the period 1995-2000, registered a positive annual average growth of 10.27%, clearly above the national average. Nonetheless, the positive annual average change in 2000-2005 was only 1.74%, returning in the years following the values close to the national average. This behaviour, atypical, may be related to the decline of the wool industry at the end of the last century, beginning of the current one. As a result of reduced monthly average income found in the regions under review, its population has a low purchasing power *per capita*, as can be seen in Table 6.

Table 6 - Purchasing power *per capita* by geographic location

NUTS III	1997	2000	2009
Portugal	100,00%	100,00%	100,00%
Alto Trás-os-Montes	54,82%	56,87%	67,43%
Ave	62,40%	66,95%	76,67%
Beira Interior Norte	60,57%	66,13%	73,53%
Beira Interior Sul	71,43%	74,80%	87,51%
Cova da Beira	67,00%	71,55%	78,63%
Dão-Lafões	59,98%	64,66%	72,53%
Douro	50,87%	54,99%	70,88%
Tâmega	47,15%	53,22%	63,48%

Source: Own elaboration, based on data available in www.ine.pt

Analysing the figures presented in the tables discussed throughout this point, it can be seen that the population density is quite different when considering the coast or the interior of Portugal, as well as the active population is, in relative terms, higher in coastline, which highlights these regions more attractive for fixing active population. This phenomenon is in agreement to the arguments by Ludema and Wooton (2000) that indicates that firms attract population. It is indeed where companies exists that attract the population or where there are people that come up more companies.

Not being objective of this paper to determine which of the components is cause or effect, it is still an issue that we consider of interest to see what should be the policies to follow, so that one can speak of harmonious development of the country, striving to interior of desertification with sustainable measures.

Objectives and research hypotheses

This study aims to analyse of the factors that can determine the profitability of the companies active in the interior of Portugal, including the location of companies and

the TOC responsible for accounting. I.e., by the number of variables in research, we intend to realize what or which of these variables exert a greater influence on the profitability of the asset (measure by the return on assets –ROA).

The objective, as defined above, raises the research question indicated in Point 1 of this paper, being our purpose to respond to it along this paper. Additionally research hypotheses were formulated, supported by the review of the literature conducted and determinants associated with the tangibility of the asset (H5), using as proxy the current assets of the company; growth opportunities (H3), using the gross investment as an indicator of these opportunities; the cost of debt, measured by the financial expenses (H4); the level of indebtedness measured by its complementary which is the capital structure that is calculated by the equity ratio weighted by total assets and current liabilities by item (H1 and H6, respectively). Another determinant that is not as stated in the literature that we decided to consider equity as measured by the items: social capital, retained earnings and additional benefits. Thus, in order to answer the research question were formulated the following research hypotheses:

H1: The return on assets is related to firm's capital structure.

H2: The return on assets is related to equity of the firm.

H3: The return on assets is related to gross investment of the firm.

H4: The return on assets is related to firm's financial expenses.

H5: The return on assets is related to current assets of the firm.

H6: The return on assets is related to current liabilities of the firm.

H7: The return on assets is related to region where the firm is located.

H8: The return on assets is related to TOC responsible for the firm's accounting.

Sample and collection of data

The population of the study refers to the companies of the interior of Portugal which account for a total of 60329 companies[5] in 2009 distributed throughout the interior of Portugal. The sample is neither probabilistic nor random, being considered casual or

[5] One of the conditions for the company be part of the sample is to be presented IES in the years 2006 to 2009, being one of the conditions so that we can ensure the balancing of the data.

convenient sample. In this type of sampling, the likelihood of an element belonging to the sample is not equal to the remaining elements, not followed, however, the basic principles of probability theory (Marôco, 2011). However, the author considers that in many research settings, it is not possible, practical or even desirable, for limited time and / or cost obtain a probabilistic sample. To collect the companies' IES, we selected only companies headquartered in the interior of Portugal, framed in Article 2º of Law No. 171/99 of 18 September, some of which are accounting firms belonging to the NUTS III: Alto Trás-os-Montes, Ave, Douro, Tâmega, Beira Interior Norte, Beira Interior Sul, Cova da Beira, e Dão Lafões. For the sample were only be considered firms incorporated under the legal form of companies.

The collection of data, from our point of view it is an added value in in this paper, insofar as 1024 companies' data were collected comprising the sample. Thus, the collected data can be classified as secondary source (Costa, 2012), since, although they are collected directly from the companies or entities related to them, they were collected through tax documents. The data collection was made through the Simplified Business Information (IES) for the years 2006 to 2009 inclusive. It should be noted that in 2006, was introduced the IES, previously known as Annual Declaration (AD). In 2010, IES was dramatically changed due to the implementation of the Accounting Standardisation System (known by the acronym SNC). Thus, during the period 2006-2009, the models used by companies to disclose their accounts remain unchanged, allowing a homogeneous computer processing for all years.

For reasons of confidentiality, from the information provided have been omitted any information that could lead to the identification of companies, having been assigned in the database a number to companies (a code) when introducing the respective data.

Employed Variables

Whereas the main objective of this research is to analyse the variables influencing the profitability of the assets of the companies of the interior region of Portugal, have set up initially the research variables, as presented in Table 7.

Table 7 - Observable variables

Name	Description	Unit	Source
X1	Total Net Assets	€	IES – A0276
X2	Turnover	€	IES – A0133
X3	Earnings Before Taxes	€	IES – A0146
X4	Employees	€	IES – A0417
X5	Financial expenses	€	IES - A0116
X6	Gross investment	€	IES - A0218
X7	Current Liabilities (Banks)	€	IES - A0317
X8	Long-term debt (Banks)	€	IES - A0299
X9	Total liabilities	€	IES - A0336
X10	Equity	€	IES - A0291
X11	Share capital	€	IES - A0277
X12	Supplementary capital contributions	€	IES - A0280
X13	Retained Earnings	€	IES - A0288
X14	Cash & Equivalents (Cash + Banks)	€	IES - A0268
X15	Current Assets - Inventory	€	IES - A0234
X16	Current Assets - Debts	€	IES - A0258
X17	Current Assets - Securities	€	IES - A0265
X18	Current Assets - Deferrals Accounts	€	IES - A0273
X19	Current liabilities	€	IES - A0331
X20	Headquarters Location		IES – Q02 n.º 1
X21	TOC – Certified Accountant		IES – Q09 n.º 2

The following variables were also used:

- Size[6] (Dim) - this variable takes the value of 1 for micro enterprises, 2 for small enterprises, 3 for medium-sized companies and the value of 4 for large companies;
- The NUT variable that takes the value of 1 for companies based in the NUT Douro, 2 for NUT Alto Trás-os-Montes, 3 for the NUT Cova da Beira, 4 for NUT Beira Interior Norte, 5 for NUT Ave, 6 for NUT Dão e Lafões, 7 for NUT Beira Interior Sul, and 8 for NUT Tamega;
- Economic activity sector (CAE), which assigns the value of 1 for the primary sector, 2 to the secondary sector and 3 for the tertiary sector. This variable was obtained based on the 2009 Portuguese classification of economic activities (revision 3). The primary sector includes the division's activities 01 to 09; the secondary sector includes the activities of the division 10 to 43 and Division 45 to 99 for the tertiary sector;
- Return on Total Net Assets (ROA), being the dependent variable, is calculated by dividing Earnings Before Taxes (EBT) by Total Net Assets.

Treatment and Data Analysis

The treatment and data analysis had begun with the reading of the IES. For this purpose we used the Able2ExtractProfessional Version 6.0 software to convert information to Excel. Once inserted the information in Excel, we proceeded to the construction of filters, which allow removing the several observable variables. Then it was constructed a database, which was analysed through IBM SPSS software version 21. During all these phases, control mechanisms have been developed in order to ensure the reliability of data (Costa, 2012). In the processing of data in Excel, a numerical coding of companies was used. Although the data obtained, the tax returns do not have confidential character, this procedure ensures the confidentiality of it, given that they are not publicly available (Desai & Dharmapala, 2009).

The general model to use is expressed in Equation 1:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_k + \varepsilon_i, \ (i=1, 2, \ldots, n) \qquad (1)$$

[6] The criteria set out in the Commission Recommendation 2003/361 / EC of May, 6 were followed and are used observable variables Total net assets, Turnover and Employees.

Where,

Y_i: Dependent variable (ROA - Return on Total Net Asset)

X_1, X_2, ..., X_k: are the independent variables presented in Table 6 above;

β_0: the interception coefficient;

β_k: is partial independent variable slope (k = 1, ..., n);

ε_i: random error.

Collected all the information, we must encode it, in order to measure the concepts, establish causality and create associations between variables. Thus, we proceeded to descriptive statistical analysis. Given that include several explanatory variables, or independent variables, we used multiple linear regression (Rodrigues, 2012).

Analysis and discussion of results

Sample Characterization

The sample characterization will be done by sector, by size and by region. In terms of sector of activity, companies were classified into three sectors: primary, secondary and tertiary due to simplification and clarity of analysis. Companies were also divided by size into 4 groups: micro, small, medium and large companies. Table 8 exhibits the distribution of companies (number) in the sample by size and economic sector.

Table 8 – Number of companies in the sample by size and activity sector

Size of firm		**Activity Sector**			**Total**
		Primary	**Secondary**	**tertiary**	
Micro	n	32	201	608	841
	% Size of firm	3,8%	23,9%	72,3%	100,0%
	% Activity Sector	82,1%	70,0%	87,1%	82,1%
Small	n	6	73	79	158
	% Size of firm	3,8%	46,2%	50,0%	100,0%

	% Activity Sector	15,4%	25,4%	11,3%	15,4%
Medium	n	1	10	10	21
	% Size of firm	4,8%	47,6%	47,6%	100,0%
	% Activity Sector	2,6%	3,5%	1,4%	2,1%
Large	n	0	3	1	4
	% Size of firm	0,0%	75,0%	25,0%	100,0%
	% Activity Sector	0,0%	1,0%	0,1%	0,4%
Total	**n**	**39**	**287**	**698**	**1024**
	% Size of firm	**3,8%**	**28,0%**	**68,2%**	**100,0%**
	% Activity Sector	**100,0%**	**100,0%**	**100,0%**	**100,0%**

Table 9 presents a characterization of the sample by NUT III and activity sector (number of companies in each category).

Table 9 - Number of companies in the sample by activity sector and NUT III

NUT III		Economic Activity Sector			**Total**
		Primary	**Secondary**	**Tertiary**	
Douro	n	11	37	143	191
	% NUT III	5,8%	19,4%	74,9%	100,0%
	% Activity Sector	28,2%	12,9%	20,5%	18,7%
Alto Trás-os-Montes	n	10	80	220	310
	% NUT III	3,2%	25,8%	71,0%	100,0%
	% Activity Sector	25,6%	27,9%	31,5%	30,3%
Cova da Beira	n	1	13	44	58

	% NUT III	1,7%	22,4%	75,9%	100,0%
	% Activity Sector	2,6%	4,5%	6,3%	5,7%
Beira Interior Norte	n	3	16	39	58
	% NUT III	5,2%	27,6%	67,2%	100,0%
	% Activity Sector	7,7%	5,6%	5,6%	5,7%
Ave	n	0	6	9	15
	% NUT III	0,0%	40,0%	60,0%	100,0%
	% Activity Sector	0,0%	2,1%	1,3%	1,5%
Dão-Lafões	n	9	83	174	266
	% NUT III	3,4%	31,2%	65,4%	100,0%
	% Activity Sector	23,1%	28,9%	24,9%	26,0%
Beira Interior Sul	n	1	21	22	44
	% NUT III	2,3%	47,7%	50,0%	100,0%
	% Activity Sector	2,6%	7,3%	3,2%	4,3%
Tâmega	n	4	31	47	82
	% NUT III	4,9%	37,8%	57,3%	100,0%
	% Activity Sector	10,3%	10,8%	6,7%	8,0%
Total	**n**	**39**	**287**	**698**	**1024**
	% NUT III	**3,8%**	**28,0%**	**68,2%**	**100,0%**
	% Activity Sector	**100,0%**	**100,0%**	**100,0%**	**100,0%**

To draw up the tables below, Tables 10 to 13, we excluded two companies in the sample, they present unusual features for a company such as Total Net Asset be zero as they can skew the results. Everything indicates that this may be related to accounting errors. Were also excluded from the sample, two firms for presenting excessively negative Earnings Before Taxes (EBT) compared with the Total Net Asset, that may likewise, skew the results.

Thus, by analysing the results presented in Table 10, it appears that 81.7%, of the 4080 IES, concern to micro-enterprises' IES and only 0.3% are related to large companies.

Table 10 - Earnings Before Taxes of the companies in the sample

Size	**n**	**Mean**	**Standard deviation**	**Minimum**	**Maximum**
Micro	3333	7.344 €	47.356 €	-387.260 €	1.555.771 €
Small	634	45.632 €	200.274 €	-1.901.885 €	2.095.472 €
Medium	99	225.906 €	941.431 €	-5.956.128 €	3.688.968 €
Large	14	5.870.475 €	7.783.250 €	404.722 €	26.241.808 €
Total	**4080**	**38.716 €**	**583.788 €**	**-5.956.128 €**	**26.241.808 €**

In Table 11 we present the number of observations by firm size for situations in which registered a negative EBT and a positive EBT, in each year under appraisal. Over the four years under appraisal, of the 4.080 observations in the study, 26.7% had a negative EBT. This amount breaks down by four years in study, evenly, with a slight increase in 2008, but just down the following year. Making the analysis by size of companies it can be seen that micro-enterprises are those with the highest percentage of companies with negative EBT (28.9%), followed by medium-sized companies (19.2%) and then small businesses (17.2%). It should be noted that in our sample large companies have a positive EBT in all the years under review.

Table 11 – Number of companies with positive and negative EBT

Companies size			**year**				**Total**
			2006	**2007**	**2008**	**2009**	
Micro	Positive EBT	n	596	607	577	591	2371
		% Total	17,9%	18,2%	17,3%	17,7%	71,1%
	Negative EBT	n	232	230	254	246	962
		% Total	7,0%	6,9%	7,6%	7,4%	28,9%
	Total	*n*	*828*	*837*	*831*	*837*	*3333*
		% Total	*24,8%*	*25,1%*	*24,9%*	*25,1%*	*100,0%*
Small	Positive EBT	n	133	126	128	138	525
		% Total	21,0%	19,9%	20,2%	21,8%	82,8%
	Negative EBT	n	29	28	32	20	109
		% Total	4,6%	4,4%	5,0%	3,2%	17,2%
	Total	*n*	*162*	*154*	*160*	*158*	*634*
		% Total	*25,6%*	*24,3%*	*25,2%*	*24,9%*	*100,0%*
Medium	Positive EBT	n	22	22	18	18	80
		% Total	22,2%	22,2%	18,2%	18,2%	80,8%
	Negative EBT	n	5	4	7	3	19
		% Total	5,1%	4,0%	7,1%	3,0%	19,2%
	Total	*n*	*27*	*26*	*25*	*21*	*99*
		% Total	*27,3%*	*26,3%*	*25,3%*	*21,2%*	*100,0%*
Large	Positive EBT	n	3	3	4	4	14
		% Total	21,4%	21,4%	28,6%	28,6%	100,0%
	Total	*n*	*3*	*3*	*4*	*4*	*14*
		% Total	*21,4%*	*21,4%*	*28,6%*	*28,6%*	*100,0%*
Total	Positive EBT	**n**	**754**	**758**	**727**	**751**	**2990**
		% Total	**18,5%**	**18,6%**	**17,8%**	**18,4%**	**73,3%**
	Negative EBT	**n**	**266**	**262**	**293**	**269**	**1090**
		% Total	**6,5%**	**6,4%**	**7,2%**	**6,6%**	**26,7%**
	Total	**n**	**1020**	**1020**	**1020**	**1020**	**4080**
		% Total	**25,0%**	**25,0%**	**25,0%**	**25,0%**	**100,0%**

The values shown in table 12 suggest, as was expected, that both the total net assets and the turnover, vary according to the size of companies.

Table 12- Total Net Asset and Turnover of companies in the sample

		Company's size				
Variable		**Micro**	**Small**	**Medium**	**Large**	**Total**
Total net asset	**n**	3333	634	99	14	4080
	Mean	296.101 €	1.370.504 €	7.997.452 €	112.336.637 €	1.034.378 €
	Standard deviation	795.489 €	1.617.090 €	7.881.797 €	77.457.053 €	8.105.239 €
	Minimum	867 €	34.356 €	144.259 €	30.149.292 €	867 €
	Maximum	21.944.133 €	18.087.392 €	39.936.071 €	227.829.338 €	227.829.338 €
Turnover	**n**	3333	634	99	14	4080
	Mean	234.519 €	1.539.419 €	10.542.106 €	128.069.481 €	1.126.050 €
	Standard deviation	342.103 €	1.885.566 €	12.145.771 €	84.079.383 €	9.211.881 €
	Minimum	- €	23.676 €	218.495 €	38.410.861 €	- €
	Maximum	4.314.731 €	22.557.849 €	98.402.341 €	279.465.299 €	279.465.299 €

Variables that determines the return on total net asset

After a brief characterization of the sample we carry on with the determination of the relationship between variables using linear regression by the least ordinary squares method. The fitted model has a coefficient of determination, R^2 Adjusted, of 0.555. That is 55.5% of the Return on Total Net Assets can be explained by the independent variables in the model through the method "Enter," and the remaining variability may be explained by factors not included in the model. The ANOVA shows that the model is significant for any level of significance (p-value <0.001). The model shows indicates non-autocorrelation, as the Durbin-Watson test has the value of 1,958. As a result, the residuals are independent. The independent variables show no multicolinearity problems since all VIF are less than 10.

Table 13 – Linear regression results

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-,011	,008		-1,293	,196		
Capital structure	,472	,008	1,403	60,820	,000	,206	4,865
Gross Investment	-,019	,003	-,084	-7,209	,000	,801	1,248
Share capital	-,418	,009	-,960	-44,830	,000	,239	4,187
Financial Expenses	,437	,153	,030	2,859	,004	,973	1,028
EBT to Turnover Ratio	,006	,001	,081	7,544	,000	,948	1,054
Size	-,014	,004	-,040	-3,672	,000	,929	1,077
Current Asset - Inventories	-,035	,007	-,055	-4,659	,000	,796	1,256
Current Asset - Securities	-,146	,045	-,034	-3,252	,001	,973	1,028
Cash & Equivalents (Cash + Banks)	-,041	,009	-,051	-4,334	,000	,795	1,259
Current Assets - Deferrals Accounts	-,188	,051	-,039	-3,711	,000	,975	1,025
Retained Earnings	-,403	,009	-1,471	-45,563	,000	,105	9,520
Supplementary capital contributions	-,392	,011	-,575	-35,171	,000	,409	2,446
Current Liabilities (Banks)	-,027	,010	-,029	-2,596	,009	,883	1,133
TOC – Certified Accountant	,004	,002	,018	1,724	,085	,961	1,041
NUT III (location)	,003	,001	,038	3,594	,000	,963	1,038

By the analysis of Table 13 it is found that all the independent variables included in the model, have a negative coefficient, with the exception of the following independent variables: capital structure, financial expenses, return on turnover, location of companies and TOC responsible for accounting. All independent variables

that have a negative coefficient, except for the "size" of the company, are extracted from the companies' balance sheet. This behavior of the variables may be considered normal in view of the fact that the smaller the total net asset of companies greater is the dependent variable "return on total net asset". The result obtained by the independent variable "size", it is nonetheless surprising to the extent it indicates to us that large companies have lower returns than small companies.

The independent variable that contributes positively to the return on total net assets is the capital structure (47.2%), validating in this way H1. Followed by the financial expenses (43.7%), validating the H4. This behavior may indicate that companies in the sample follow the theory of trade-off since the financial expenses contribute positively to the generation of return on total net assets.

In order to test H7, the methodology used in the previous hypothesis test was followed. The possible validation may indicate that location of a company (the region where a company belongs) will influence the return on net assets.

Table 14 – Average Return on net assets by District

Headquarter location	**Mean**	**n**	**Std. Deviation**	**Minimum**	**Maximum**
Bragança	0,0111293	951	0,1554	-1,5290	0,6740
Vila Real	0,0137487	959	0,1653	-1,5550	0,9610
Guarda	0,0046757	259	0,2021	-1,9390	0,5300
Castelo Branco	0,0237241	406	0,1745	-1,2460	0,5750
Viseu	0,0302506	1185	0,1663	-1,3770	0,9730
Aveiro	0,0292500	28	0,1718	-0,6290	0,2910
Porto	0,0993750	16	0,0669	0,0140	0,2230
Braga	0,0036513	261	0,1757	-1,4840	0,5020
Total	**0,0181601**	**4065**	**0,1676**	**-1,9390**	**0,9730**

Analysing table 14, we observe that Porto and Viseu districts are those that show higher average return. Guarda and Braga districts are those that display lower average return on net assets. In this way, we confirm that the region where is the

location of companies' headquarters influences its return. It is verified, consequently, that the region where the company is located influences their profitability. In this sense, to validate the H7 we proceeded to the application of statistical nonparametric Kruskal-Wallis test. Therefore, it has been found the violation of the assumption of normality of the variables as well as the violation of the sample size assumption. It is noted that this is one of the suitable tests to compare the distributions of two or more variables observed in two or more independent samples (Marôco, 2011). The results show a χ^2= 53.984 with 7 degrees of freedom and a p-value <0.001, which allows to reject H0. It follows, in this way; there is at least one district in which companies, located in it, have different return from the rest.

With regard to TOC and given the important role they have in SMEs, as several studies stated (*e.g.,* Carvalho, 2013; Guerrero, 2012; Pereira, 2012), we tried to assess whether there is a relationship between TOC and corporate profitability. Our sample, over 4 years of analysis, has 529 responsible TOC, accounting for 4065 observations under analysed (i.e., number of IES in the sample). This variable, in the regression analysis shown in Table 15, it is not statistically significant at the 5% significance level. If we assume a 10% significance level obtained a 1.8% impact on the profitability of Total net Assets, the H8 is validated. As shown by the table 15 analysis, the average ROA increases as the TOC is responsible for a larger number of accounts Fernandes (2013) obtained similar behaviour when he compares the number of accounts a TOC is responsible with the use of tax benefits to the interior by companies.

Table 5 – Average return (standard deviation) on total net asset by group of TOC.

n.º accounts / TOC	**Mean**	**N**	**Std. Deviation**
<=20	0,012390	2248	0,181964
[21;60]	0,018939	724	0,161850
>=61	0,029512	1093	0,137140
Total	0,018160	4065	0,167553

Thus, by the described above, as well as the values shown in Table 15, there seems to be differences between companies in its profitability due to the TOC that is responsible for accounting. However, to support this suspicion there is a need to resort to a statistical test. The results obtained by the statistical test of Kruskal-Wallis χ^2 = 4,537, with 2 degrees of freedom and a p-value = 0,103, indicate not reject H0. We conclude therefore that the differences observed are not statistically significant, thus, not validating H8. Meaning it is not because the companies have a TOC that will get better returns.

Conclusion and suggestions for future research

This study aims to the analysis of the factors that can determine the profitability of the companies located in the interior of Portugal. For this purpose we took into account a sample of 1,024 enterprises, located in the interior north and center of Portugal, from various sectors of economic activity.

It was made a characterization of the business fabric of the interior regions of Portugal. It turns out that both the national and regional level, the business fabric consists mainly of small companies. Although the interior regions corresponds approximately 72% of the total national geographical area, only 19% of total national companies are located in the inland. With regard to the resident population, the interior corresponds to only 22% of national population resident. Only with regard to the number of companies per resident population is that the interior regions (0.1544) have a value close to the national average (0.1719). We observe that the average salary in the interior regions corresponds from about 70% to 80% of the average salary at national level. The weight that these regions represent in the national GDP is very low, and Ave region is the one that has a greater weight with about 3.5% in 2009. This gives a per capita purchasing power lower than the national average of about from 63% to 87.5%. In other words, these indicators reveal the fragile economic situation they are in the interior regions of Portugal.

We observed that the group of micro-enterprises is the one with greater disparities of Net Total Assets as well as higher turnover. This situation shows that micro-

enterprises invested proportionally more than large companies, however, this investment appears to be less profitable in micro-enterprises, despite the increase in turnover. Serrasqueiro et al. (2010) reached similar conclusions in the sense that small companies have an investment in research and development that does not translate into the company's profitability increases. However, according to Audretsch, Klomp, Santarelli and Thurik (2004), small businesses can have a high growth potential, as they often operate on a scale of production below the optimum, which supposes the partial use of internal capacity as well as the partial operation of the market, where they are located. Through multiple linear regression found that items of the balance sheet, taken in isolation in the model, negatively affect the return on total net assets. However, the capital structure, measured by the ratio between shareholders' equity and the net total assets, is positively and statistically significant related to that return, and has the highest coefficient. The retained earnings have a negative average value as a result of successive negative results accumulated over the years. The fact that this variable has a negative coefficient with a high load in the linear regression model can be related to the fact that average value of this variable is negative. Also note that the results indicate that companies may be following the tradeoff theory, since the coefficient of financial expenses is positive and statistically significant.

As limitations of this study we may consider the fact that the sample is only made up of enterprises with legal structure of companies without regard to individual entrepreneurs. Since the sample is convenience, it may be another limitation of work. As suggestions for future research proposes the same analysis by sector and company size. You can also use other proxies for the determinants of tangibility and growth opportunities.

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