GESTIÓN SOCIAL

ORGANIZACIONES HUMANAS PARA UNA SOCIEDAD GLOBAL INCLUYENTE

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ÍNDICE

Determinants of assets profitability:
Differences due to activity sector and company size

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Abstract

Knowing the determinants of the profitability of a company is crucial for management but also for policy-makers at regional and national level to adopt measures to promote regional development. The interior region of a mainland Portugal is facing some problems related to aging population, lack of opportunities for young people, depressed and weak economy, where it is necessary to take measures to strengthen the business environment and gain power of attractiveness.

In this paper we use a unique, privately database with financial data (and some non-financial variables)of 1,024 enterprises headquartered in the interior north and center of mainland Portugal for the time period of 2006 to 2009 to answer to the research question: “The return on total net assets (ROA) is influenced by the size, location and the corporate activity sector?”.

Applying a positivist quantitative approach by a descriptive analysis and inferential analysis through the Kruskal Wallis test, we tested three main hypotheses. Our results seem to indicate that the profitability of companies (as measured by ROA) is influenced by economic activity sector and localizations of the company (geographic region) but not by company size.

Keywords: Return on Assets, Economic Activity Sector and Interior Regions.

Introduction

For some authors, namely Ayyagari, Beck and Demirgüç-kunt (2003), Psillaki and Daskalakis (2008) and Schmieder, Marsch, and Forster-van Aerssen (2009), companies, mainly SMEs - Small and Medium Enterprises, are the basis of market economies, being essential its existence for the development of a region. The location of this type of companies outside of the major industrial zones, involves a higher

technical personnel costs and poor quality of infrastructure and telecommunications (Bennett, Robson & Bratton, 2001).

This seems to be one of the reasons leading countries in general, and the European Commission in particular, to develop measures to enable regions affected by difficulties in the development of economic activities, to overcome these same difficulties (Fernandes, 2013). These measures are intended to promote regional entrepreneurship, focusing on the support, in the kind of entrepreneurs that a region needs. As an example, we can say that the entrepreneurs of the commercial area may be attracted to regions with high population density and high yields, while the entrepreneurs of the industrial sector may be attracted to regions with low wages and well-developed infrastructure. The choice of investment location is driven by regional opportunities with the presence or absence of barriers to entry (Verheul et al., 2008). Regional opportunities may be related to several factors, among which the activity sector.

In this sense, this raises the research question: "The return on total net assets (ROA) is influenced by the size, location and the corporate activity sector?". Since the publication of Modigliani and Miller (1958) research that studies on the companies' capital structure have multiplied but these focus mainly on large or listed companies. Nevertheless, in Portugal, as in most countries, large and listed enterprises represent a small percentage of companies operating in the economy. The Portuguese business fabric is dominated by Small and Medium Enterprises (SMEs), that is companies that have fewer than 250 employees (and a turnover of less than 50 million Euros or total assets less than 43 million Euros[1]), and more than 95% have fewer than 10 employees (INE, 2015). Morrison, Breen, and Ali (2003) also recognize the importance of SMEs in the global economy.

This paper focuses on a population of companies, predominantly SMEs, located in the interior of Mainland Portugal. We will apply the Kruskal-Wallis test methodology to test the research hypotheses, using financial data collected in the time frame 2006-

[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.

2009. The aim of the paper is to test if company' size, geographic location of headquarters and economic activity sector have influence on return on total net assets (ROA). That is, we intend to test if the ROA differ among companies due to these variables.

The paper is organised in five sections as follows. After this brief introduction, we discuss the influence of size, activity sector and location on the profitability of companies through a short concise literature review. On section 3 we start by doing the characterisation of the population under analysis – companies of Portugal. We also characterised briefly the economic fabric of Portugal and the geographic regions under consideration exhibiting some core social and economic indicators. Then we present the objectives and research hypotheses; the sample and data collection methods followed by the description of employed variables and this section ends with methods for data treatment and analysis. In section 4 we exhibit and analyse the results. It starts by the sample characterisation, using frequencies and summary statistic. After we analyse the influence of the variables size, activity sector and dimension applying the descriptive analysis and inferential analysis through the non-parametric test of Kruskal Wallis to test the research hypotheses developed initially and discuss the results. It ends with a conclusion and future research suggestions where the remarkable results are discussed in an integrated manner, the main limitations of the research is presented and finally some suggestions for further research.

The profitability of enterprises

The profitability of companies is related to the performance that is in their environment. The performance assessment is considered a key principle in the management of companies (Muchiri, Pintelon, Gelders & Martin, 2011). This theme became recurring for many managers, being of interest to managers and researchers (Venkatraman & Ramanujam, 1986). Competitive pressure, as well as the evolution of products and technological processes, challenge management systems to further improves the performance indicator in terms of its design and use at both strategic

and operational level (Lima, Costa Angelis & Munik, 2013). According to Zu, Robbins and Fredendall (2010) strategic management system indicator of performance is a system that uses information about the performance to produce a positive change in organizational culture, through their systems and processes.

Venkatraman and Ramanujam (1986) consider that a narrower concept of business performance focuses on the use of financial indicators supported by simple results. According to these authors, these are assumed to reflect the compliance of the economic objectives of the companies, such as the analysis of several indicators like sales growth, profitability, sales turnover, net income, among others. However, taking into account a broader concept of performance of a business, should be given relevance to operational performance indicators, i.e., non-financial indicators in addition to financial performance indicators.

According to some authors, such as Muchiri et al. (2011), well-defined performance indicators can potentially identify and support gaps in the company's performance to compare actual performance with the desired performance. In this way, one obtains an indication of the achieved progress in order to eliminate gaps. Within the framework of performance is logical to address measures such as: participation in the markets, the introduction of new products, product quality, marketing effectiveness, value-added production, and other technical efficiency measures in the field of business performance (Eisenmann, 2006; Venkatraman & Ramanujam, 1986).

This business performance may be dependent to some extent, from normal wear and tear of non-current assets, as well as the deterioration of those assets, or other failures that may occur, especially when the equipment goes beyond the limits of its useful life. As a result, downtime of equipment, quality problems, speed losses, security risks or environmental pollution negatively affect operating costs, profitability, customer demand satisfaction, and productivity among other important requirements the company's performance (Muchiri et al., 2011). To combat these factors it is necessary to set a proper maintenance of all equipment, supported by a particular maintenance strategy in a coherent manner taking into account certain factors such as the company's policy, production policy and other policies that cause restrictions

on business (Swanson, 1997, 2001). In this manner, it becomes relevant an adequate maintenance management of the production equipment so that a company be able to keep itself productive and profitable (Van Horenbeek & Pintelon, 2014).

The company's performance as well as their growth is very dependent on investment. The companies that carry out more investment mainly when this investment is related to innovation, in general, are able to generate greater technological capacity, in terms of its processes and product innovations, obtaining as a result, a greater effect on the performance and growth of the company (Wang & Shyu, 2009; Zahra and Das, 1993). For companies to carry out investment, need affordable sources of financing either in quantity or in price. However, in inefficient economic systems, in which are evident the difficulty in the access to finance, these difficulties have a negative impact, both direct and indirect, on the performance of companies with consequences for economic growth (Schneider & Veugelers, 2010). That is one of the reasons given by Schneider and Veugelers (2010) to justify the difference in growth performance between companies in the European Union and those from the United States. To overcome these limitations several EU Member States have developed a number of measures to facilitate the growth and performance of the companies (Schneider & Veugelers, 2010).

Van Horenbeek and Pintelon (2014) consider that each business sector has its specific objectives at different organizational levels, which define their strategy. This recognition is crucial for the implementation and application of a system for measuring the performance.

Similarly, each business environment needs to have different performance indicators for all organizational levels in order to measure the performance appropriately. Not forgetting that those who have the power of decision can get an overview of the performance of the company at every level of management in order to improve the overall performance of the company through its profit (IPQ, 2009). Nonetheless, this also means that the people who work at different levels of management within the company have their own custom performance indicators (Van Horenbeek & Pintelon, 2014). In a study developed by Verheul et al. (2008) was examined how regional

opportunities influencing the creation of companies in 103 Italian provinces between 1997 and 2003. They consider that companies install themselves due to its own characteristics and the characteristics of the region at the same time, i.e., for example, a restaurant tends to settle in areas with high population density, while a manufacturing company in an area with good infrastructure. In the same study, one of the variables studied were the regional tax benefits, which has not found statistical evidence on the relationship between the benefits and the creation of companies. Also in this context, Audretsch and Fritsch (1999) found in a study conducted in Germany between the years 1986 and 1989 that the impact of each specific geographic variable on the creation of new businesses varies considerably between the various industries. Overall, following the conclusions of Gergely (2003), it appears that the market characteristics are among the main determinants (e.g. production costs, natural resources, transportation costs and exchange rates) for the location of investment.

Thus, it was widely accepted that the company's performance was influenced by the range of human resource management practices and human capital in the field of strategic human resource management (Wang & Shyu, 2009). Some researches (e. g., Arthur, 1994; Whicker & Andrews, 2004; Dalton, 2005; Wang & Shyu, 2009) have indicated that the effectiveness of human resource management of a company has a positive and direct impact on the performance of the organization. Gollan (2005) considers that the involvement and participation of workers in company policies, encourages workers to enhance an important contribution to the competitiveness of the company.

The performance of the company has influence in its growth that, particularly in small companies, may become a concern on the part of governments, since such companies may be largely responsible for economic development by creating employment resulting in the economic welfare of countries (Morrison, Breen & Ali, 2003). Growth can be measured by several variables including the number of jobs, sales growth and asset growth, among others (Birley & Westhead, 1990; Laitinen, 2014; Wang & Shyu, 2009).

In general, entrepreneurs, mainly opportunistic, plan the growth of the company and identify growth opportunities of the company (Bracker & Pearson, 1986). Some authors (and g, Birley & Westhead, 1990; Taani, 2013) consider that the size of the company has no significant effect on its performance. The performance of the companies is enhanced through rules, procedures and well-defined structures, which highlights the consistency and budget estimate (Berson, Oregon & Dvir, 2008). The growth and performance of an (small size) enterprise can be seen, in a simple way, as the ease at which the owner and manager adapts and learns from the experience of dealing with the internal environment and the external environment in which the company run its business (Birley & Westhead, 1990; Eisenmann, 2006). The individual values of the entrepreneurs are the key to understand the relationship between the personal characteristics of entrepreneurs and the performance of the company (Berson et al, 2008; Tomczyk, Lee & Winslow, 2013).

Enz (1988) considers that the main managers intend to transmit their values to employees as a way to shape their behaviour and manage in this way the company. Thus, the values of the managers have a significant influence on their perceptions and behaviour, which in turn play a role in shaping the organization's characteristics and their performance (Berson et al., 2008).

Research methodology

Characterisation of Interior Regions of Mainland Portugal

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% (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, of the 1,198,781 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.

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 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

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

[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 (102) people aged 65 and over) (INE, 2011).

[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).

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.

As a consequence of the supremacy of the crude death rate on the crude birth rate, observed in the interior of Portugal, we obtain an aging index by place of residence, in the interior near twice of that observed at national level. From the comparison between the interior of Portugal with overall country data, it can be concluded that the number of companies per inhabitant does not differ significantly throughout the national territory, with the exception of large companies (Fernandes & Vaz, 2013). Therefore, the interior of Portugal has a significant deficit of population, especially active population.

After the description of the entire interior of Portugal, the following indicators are divided by NUTS III[5] that will be object of study in this paper, in order to better understand the framework 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

[5]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).

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.

For the number of physicians per 1,000 inhabitants, the situation in the regions under consideration is not very different from the previous analysis. I.e., from 2002 to 2009, the number of physicians experienced a positive annual average change of about 2.5% in Portugal, although the observed increase in the regions under consideration was higher, with the exception of Douro which presents an increase equal to the national. What somehow becomes disturbing is the value that this ratio assumes in the regions under analysis. In the Tamega region this ratio represents 23.68% of the national average in 2009, being the region of Dão Lafões that is closer to the national values, yet has only 63.16% of the national average.

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.

Finally, 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%. 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*. It can also be noted 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 point out that enterprises 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 Hypothesis

The objective of this research aims to analyze the factors that may influence the profitability of the companies' assets in the interior of Portugal, including the size of the company, its sector of activity and its location. In other words, through a number of variables under research, we intend to realize what or which of these variables exert a greater influence on the profitability of the asset.

The objective defined above, raises the question of research: "The return on total net assets (ROA) is influenced by the size, location and the corporate activity sector?" as indicated previously in this paper, being our purpose to answer it throughout this manuscript. Further, the following research hypotheses have been formulated supported by the performed literature review:

H1: The return on assets is influenced by the size of the companies.

H2: The return on assets is influenced by the corporate business sector.

H3: The return on assets is influenced by the location of the companies.

Sample and Data Collection

The population of the study refers to the companies of the interior of Portugal which account for a total of 60329 companies[6] in 2009 distributed throughout the interior of Portugal. The sample is neither probabilistic nor random, being considered casual or 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 2.º 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, the information provided omit any information that could lead to the identification of the companies, having been assigned to the database, a number (code) to the companies when introducing the respective data.

Variables Used

Considering that the main objective of this research consists of analyzing the influencing variables of the asset profitability of companies in the interior region of Portugal, we have set up initially the research variables as presented in Table 1.

Table 1

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	Headquarters Location	€	IES – Q02 n.º 1
X6	CAE - Portuguese Classification of Economic Activities	€	IES – Q09 n.º 4

The following variables were also used:

- Size (Dim)[7] - 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): CAE-Rev.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

[7] 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.

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).

Given that this research fits, methodologically in the quantitative positivist approach, there is critical need of using statistical techniques that allow us to test the research hypothesis. The descriptive analysis is performed according to the size, the company's activity sector, and region, allowing the characterisation of the sample under consideration. It was used some descriptive measures like frequencies (absolute and relatives), central tendency measures (mode, median and mean) and dispersion measures (range, standard deviation, etc.)

To test our hypotheses we used the parametric t-Student test or non-parametric Wilcoxon test to test the equality of the means of ROA; It was also used a parametric one-way ANOVA test or the nonparametric Kruskal-Wallis test in order to test the equality of the median of the growth and performance, with regard to size, activity sector (CAE) and region (location). As the Kruskal-Wallis H test does not assume normality in the data and is much less sensitive to outliers, it can be used when these assumptions have been violated and the use of a one-way ANOVA (Marôco, 2011).

The hypotheses of the Kruskal-Wallis test are as follows:

H_0: $\theta_1=\theta_2=\cdots=\theta_k$ (medians are equal)

H_1: $\exists\, i, j: \theta_i \neq \theta_j$ $(i \neq j = 1,\ldots,k)$ (there is at least one pair of significantly different medians)

Therefore, the null hypothesis (H0) means that the median of the variable are equal, and is tested against the hypothesis that there exists at least one pair of median significantly different (alternative hypothesis H1). To reject / not reject the hypothesis was established a 5% significance level.

Results

Characterisation of the sample

The sample characterization was 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 2 exhibits the distribution of companies (number) in the sample by size and economic activity sector. The majority of companies in the sample are micro, small and medium enterprises. However, the number of medium and large companies is reduced. The substantial number of micro companies that make up the sample can serve the purpose advocated by Ramalho and Silva (2009) who believe that this group of companies should have special attention, given the weight they have in the Portuguese business structure.

Table 2

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%**

In terms of sector of activity, according to the analysis of Table 2, the tertiary sector is the one with the largest number of companies, followed by the secondary sector and, finally, the primary sector. These figures follow the trend of the Portuguese business fabric, where the tertiary sector has about 83% of the number of companies, followed by the secondary with about 16.5%, and the primary with only 0.5%.

Regarding the NUT III, which have a higher number of companies in the sample, and belonging to the primary sector, are the Douro and Alto Trás-os-Montes as evidenced by the analysis of Table 3. Drove this result may contribute the weight of companies in the agricultural sector in the region. The NUT III Ave is the one with the highest number of industrial companies, a region dominated by companies in the industrial sector.

Table 3

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

NUT III		Economic Activity Sector			Total
		Primary	Secondary	Tertiary	
Douro		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 4 to table 7) some companies in the sample were excluded because they present unusual accounting features.

Therefore, by analyzing the results reported in Table 4 it is found that of 4,080 IES, 81.7% are relate to IES of micro- enterprises and only 0.3% relate to large companies.

Table 4

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 €

Table 5 exhibits the number of observations by firm size for situations in which was registered a negative and a positive Earnings Before Taxes (EBT), in each year of the time horizon under analysis. During the four years under review, of the 4080 observations, 26.7% had a negative EBT. This amount is split among the four years uniformly with a slight increase in 2008, but just decreasing in the following year. Making the analysis by size of company, one can be seen that the micro-enterprises are those with the highest percentage of companies with negative EBT (28.9%), followed by medium-sized enterprises (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 5

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%

Tables 6 show values that suggest, as was expected, that both the average value of the total net assets either turnover, vary according to the size of firms.

Table 6

Summary statistics of variables: Total Net Asset and Turnover

Variable		Company's size				
		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 €

Return on Total Net Assets *versus* Size, Activity Sector and Region

The analysis of the return on Total Net Assets (ROA) of companies under review, considering as differentiating characteristics their size, the activity sector and the region (NUT III) to which they belong, will be performed with the use of bi-variate analysis tests.

Dimension (size)

As mentioned above, during the literature review, it can be seen that there are differences in the profitability of companies depending on their size. In this sense, to validate the research hypothesis H1, we applied the nonparametric statistical test of Kruskal-Wallis, given that the assumption of normality of the variables was violated as well as there was 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 = 5,613 with 3 degrees of freedom and a p-value = 0.132 which does not allow to reject the H0. We conclude, in this way, there are slight differences between independent samples relative to ROA (see table 7) but are not statistically significant.

Table 7

Ratio of EBT to Total Net Assets by size

Size	Mean	N	Std. Deviation
Micro	0,0032004	3349	0,31827507
Small	0,0151735	634	0,25228026
Medium	0,0200202	99	0,10415216
Large	0,0482857	14	0,04531671
Total	0,0056143	4096	0,30488488

Economic Activity Sector

Relative to H2 is intended to check for differences in companies' ROA, according to the activity sector to which they belong. To validate the hypothesis H2 was followed the same methodology used to test H1.

The results show a χ^2 = 13.529 with 2 degrees of freedom and a p-value = 0.001, enabling to reject H0. It follows by this way there are statistically significant differences in the companies' performance of Total Net Assets (TNA), depending on its economic activity sector.

From the analysis of results exhibited in Table 8 it appears that are the primary sector companies that have lower profitability with a negative average ROA. The secondary sector is that offers better ROA.

Table 8

The ratio of EBT and Total Net Assets by activity sector

Activity Sector	**Mean**	**N**	**Std. Deviation**
Primary Sector	-0,0178590	156	0,15029483
Secondary Sector	0,0104538	1148	0,27711540
Tertiary Sector	0,0049359	2792	0,32176121
Total	**0,0056143**	**4096**	**0,30488488**

Region (NUT III)

In order to test H3, was followed the same methodology used in the preceding hypotheses test. The possible validation may indicate that the fact that companies belonging to a particular region are not related to the profitability of TNA, so there will be no significant differences.

The results achieved by Kruskal-Wallis test, have a χ^2 = 47.335 with 7 degrees of freedom and a p-value <0.001, that allow to reject H0.

By the analysis of Table 9 it can be seen that there are some NUT III with negative average ROA.

Table 9 - The ratio of EBT and the Total Net Assets by NUT III

NUT III	Mean	N	Std. Deviation
Douro	-0,0087147	764	0,34828463
Alto Trás-os-Montes	0,0112516	1240	0,19186396
Cova da Beira	-0,0045991	232	0,26026866
Beira Interior Norte	-0,0006638	232	0,21002131
Ave	0,0298833	60	0,07256723
Dão-Lafões	0,0134906	1064	0,36471731
Beira Interior Sul	0,0457614	176	0,14064724
Tâmega	-0,0221890	328	0,46468524
Total	0,0056143	4096	0,30488488

It is verified thereby that companies, according to the regions where they are located, exhibit different average ROA. This may be due to several factors, including the type of activities in the region, education level of managers, company size, among others.

Conclusion and suggestions for future research

This paper aims to analyze if the profitability of TNA is influenced by the size, activity sector and location of the respective companies. To do so we took into account a sample of 1,024 companies, located in the interior north and centre of Portugal, from various sectors of activity.

It was carried out a characterization of the entrepreneurial fabric, of the interior regions of Portugal. It was verified that both at national and regional level, the business fabric consists mainly of micro enterprises. Although the interior regions corresponds to approximately 72% of the total national geographical area, it focuses on them only 19% of total national number of companies. With regard to the resident population, the interior corresponds to only 22% of national resident population.

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 also verified 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 higher weight to about 3.5% in 2009. This gives a per capita purchasing power that is lower than the national average from about 63% to 87.5%. In other words, these indicators reveal the weak economic situation we have in the interior regions of Portugal.

From the bivariate analysis of the ROA according to size, activity sector and geographic region of the companies, we may conclude that it seems that there are not only statistically significant differences between independent samples in relation to the size of companies. The other variables, activity sector and location we found statistically significant differences. In another words, our results seems to indicate that the profitability of companies (as measured by ROA) is influenced by activity sector and localizations of the company (geographic region) but not by company size.

This study has some limitations in which can be considered the fact that the sample is only made up of enterprises with legal structure of companies without regard to individual entrepreneurs. Since this sample is a convenience sample, it may be another limitation of research.

As suggestions for future research we propose the same analysis but extended to a more recent time frame. One can also use other proxies to the company's profitability, such as the return on equity and analyze the determinants of these returns using proxies to measure determinants such as tangibility, growth opportunities and capital structure as well as other non-financial variables.

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