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The relevance of tourism in financial sustainability of hotels

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ABSTRACT

The macroeconomic context is an extremely important factor for the growth and development of companies, and for the hotel sector, being expected that the performance of hotel companies should be strongly dependent on the conditions and the macroeconomic environment where they are inserted.

Using a panel data methodology, this research analyzed the growth of hotel companies, the size of hotel companies, total number of guests in the sector, total revenues, and total income of the sector, with the corporate indebtedness variable, given by total liabilities/total assets ratio. It is concluded that 91.5% of the average variation in the corporate indebtedness is determined by the remaining variables of the study, with the remaining 8.5% variation explained by other factors not specified. It is also concluded that there is no statistically significant difference between the values of the corporate size variable throughout the study, existing a negative relation between this variable and the variables corporate size, number of guests, and tourism revenue, and a positive relation with the variables corporate growth rate and total income of the hospitality industry.

This research provides a great contribution and enrichment of existing literature because with a detailed knowledge concerning these topics, managers' can base their decision making on these cause and effect relationships, looking for the best decisions that will provide the highest profitability.

1. Introduction

Tourism is considered the most coveted activity in the world, considering the growing number of destinations around the world that have been investing in this activity over the past six decades, making it the major driver of socioeconomic progress through the creation of jobs and enterprises, export revenues and infrastructure development, leading to a continuous expansion and diversification that reveals it as one of the fastest growing economic sectors in the growing world (UNWTO, 2017).

The macroeconomic context is an extremely important factor for the growth and development of companies, and for the hotel sector. Chen (2010) points out that tourism sector organizations are particularly exposed to economic cycles. Economic performance and its conditioning factors are a key issue in the development of the hospitality industry (Assaf & Josiassen, 2012). In this sense, the hotel industry is seen as a cyclical industry, being considered an industry highly sensitive to the state of the economy (Bodie, Kane, & Marcus, 2008; Chen, 2010). One of the reasons pointed out for this reality is that hotel companies have a large expression of fixed costs in their total costs, translating into a greater operational risk for these companies. As such, with high fixed costs, hotel companies are very sensitive to business conditions, because in periods of economic recession or contraction the sales revenues will necessarily decrease and even small decreases in sales volume, will have effects much more than proportional on their results, because of lower revenues (Chen, 2010, Graham & Harris, 1999). Given a wide range of economic and financial indicators that can be used, it is essential to understand the weight of indebtedness in tourism sector organizations, particularly in a context of financial crisis and in countries whose sector contributes significantly to the added value of the economy (Farcnik, Kuscer, & Trobec, 2015).

Undoubtedly, corporate performance is closely related to the macroeconomic context (Bodie et al., 2008; Mucharreira & Antunes, 2015). The changes that take place in the markets in which these

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companies operate will have a major impact on what concerns the expansion or contraction of their businesses. In this way, the performance of hotel companies is also strongly dependent on the conditions and the macroeconomic environment where they are inserted. Thus, the state of the economy will affect the performance of organizations, and these companies will have to organize themselves in function of market dynamics far beyond the national context, strategically prepared for the constant changes that come from an increasingly globalized context (Antunes & Mucharreira, 2015).

The expansion and growth of tourism can also have a strong influence on the business performance of the hotel industry. On the one hand, the expansion of industry or tourism activities directly increases the development of the hotel industry, increasing the occupancy rate and, consequently, sales revenue. On the other hand, the development of tourism can significantly improve the business environment, which has an indirect effect on the business performance of hotel companies. Researches carried out by several authors have shown that the expansion of tourism can boost the economy and that tourism growth leads to a better financial performance (Dritsakis, 2004; Fayissa, Nsiah, & Tadasse, 2008; Lee & Chang, 2008; Proenca & Soukiazis, 2008; Chen, 2010). The study developed by Chen (2007) showed that the growth of tourism improves economic conditions which, consequently, increases the performance of companies.

The performance of companies is a subject of enormous importance in all studies that target the organizations, due to the interest that exists in the analysis of the factors that affect the variations of the organizational performance (Hoopes, Madsen, & Walker, 2003). Financial performance, which allows to evaluate the fulfillment of the economic objectives of the organizations, has been the focus of several investigations of the performance of companies (Barney, 2002; Combs, Crook, & Shook, 2005; Hult et al., 2008; Richard, Devinney, Yip, & Johnson, 2009).

Following this framework, this research aims to analyze the relationship between several independent variables, such as the index of growth of the hotel companies, the dimension of hotel companies, the total number of guests in the sector, the total revenues of the sector (using data from the Portuguese Balance of Payments), and the total income of the sector (using information from the PORDATA database), with the dependent variable of the research, described by the financial performance of Portuguese hotel companies, at the level of their indebtedness, being this indicator obtained by the total liabilities/total assets ratio.

2. Theoretical framework

2.1. Literature review

The prospects for the future of tourism worldwide, including its contribution to economic and social development, are increasingly important. There is a significant volume of estimated demand by the increase in disposable income, demographic, social and technological changes, the diversification of destinations and the increasing liberalization of the sector. In this way, it is considered that tourism growth could have a strong influence on the organizational performance of the hotel industry. On the one hand, the expansion of industry or tourism activities directly improves the development of the hotel industry, increasing the occupancy rate and, consequently, sales revenue. On the other hand, the development of tourism can significantly improve the business environment, which has an indirect effect on the organizational performance of hotel companies (Chen, 2010). Several studies carried out previously showed that the expansion of tourism could promote the economic development

of organizations (Dritsakis, 2004; Fayissa et al., 2008; Kim, Chen, & Jang, 2006; Lee & Chang, 2008; Proenca & Soukiazis, 2008).

The concept of performance has been described as the desired outcome that can be achieved through multiple measures (Wheelen, Hunger, Hoffman, & Bamford, 2015). In this way, organizational performance emerges as a multidimensional variable and remains uncertain in the strategic orientation of the organizations, regarding a causal link, considered in a global vision, and in quality management practices, in particular (Gomez-Gras & Verdu-Jover, 2005; Hasan & Kerr, 2003). Lusthaus, Adrien, Anderson, Carden, and Plinio (2002) define organizational performance in terms of effectiveness, that is, the achievement of the mission, efficiency and permanent relevance, analyzing the extent to which the organization adapts to changes in environmental conditions. Therefore, for performance evaluation the use of financial indicators will not be enough, but also indicators of effectiveness, efficiency and relevance. However, financial performance is measured primarily through accounting headings which are common to all companies, and other industry-specific indicators of which the company is a part.

Several studies have been carried out based on several indicators that measure the financial performance of hotels, such as, total gross profit or the daily occupancy rate of hotels (Claver-Cortés, Molina-Azorín, & Pereira-Moliner, 2007; Min, Min, Jong, & Kim, 2009; Pereira, Claver, & Molina, 2011), total revenues and revenues per room (Chen, 2011; Chung & Kalnins, 2001; Xiao, O'Neill, & Mattila, 2012), the ratio between net operating income and operating expenses (Chen & Lin, 2012), return on assets (ROA) (Athanasoglou, Brissimis, & Delis, 2008; Tavitiyaman, Qiu, & Qu, 2012), return on equity (ROE) and stock returns (Chen, 2007, 2011), net profit (Tavitiyaman et al., 2012), and net profit margin (Jae & Jang, 2007).

Although tourism development is expected to have a direct positive impact on hotels, this can also affect the hotel industry through its ability to improve the state of the economy, thus strengthening hotel business performance. Several empirical studies have supported this evidence that the expansion of tourism can improve the economic condition of the hotels (Balaguer & Cantavella-Jorda, 2002; Dritsakis, 2004; Gunduz & Hatemi-J, 2005; Kim et al., 2006). In this way, tourism growth can promote business and boost sales and profits of companies, thus strengthening the financial performance of hotel companies (Chen, 2010). It is expected, therefore, that the variable of the total number of tourists has an impact on the business performance of the hotel industry. From a business performance standpoint, Chen (2010) argues that tourism development can influence the performance of the company because tourism growth can improve profits and sales and, thus, boost the financial performance of hotels. The results obtained by the author, in a previous research, support a positive relation between the increase of foreign tourism and financial performance in the hotel industry of Taiwan.

On the other hand, other internal variables related to hotel corporations may also be relevant for the analysis of hotel performance. Several researchers have studied the most significant indicators of financial performance (Chung & Kalnins, 2001; Gursoy & Swanger, 2007; Okumus, 2002; Reichel & Haber, 2005). For example, Claver-Cortés et al. (2007) have shown that hotel management, hotel category, and hotel size are strategic determinants of performance. There is, likewise, a vast literature that seeks to identify the relationship between the size of the hotel and its financial performance. Researchers such as Chung and Kalnins (2001), Israeli (2002), Chen and Tseng (2005), Barros and Mascarenhas (2005), Claver-Cortés et al. (2007), and Rodríguez and Cruz (2007) presented evidence of the positive relationship between the size of the hotels and their financial performance. This positive

relationship was also confirmed by Pine and Phillips (2005), and Kim, Cho, and Robert (2013).

2.2. The importance of tourism in the Portuguese business sector

Tourism is a strategic economic activity for the economic and social development of Portugal, concerning employment and the growth of exports. The natural and climatic conditions, the great competitiveness in relation to Portuguese prices, hospitality and culture, in addition to the landscape and national heritage, are aspects that favor the development of tourism and economic activity. Tourism is one of the main sectors of the Portuguese economy, if not the most important, since it has a very important contribution to Gross Domestic Product (GDP), exports, investment and job creation.

The tourism sector is currently the main engine of the national economy, recording consistent growth levels in recent years and reaching historic highs in the main indicators: income, guests, employment and exports, and is considered the country's largest export activity, accounting for 16.7% of total exports. Portugal is considered one of the most competitive countries in the world in the tourism sector, having received, in 2016, for the first time, more foreign tourists than the total Portuguese resident population – 11.4 million. The revenues generated by tourism have also registered strong growth and, currently, the sector has a weight in GDP of almost 7% (PORDATA, 2016).

3. Empirical research

3.1. Definition of variables and research hypotheses

This research aims to study the performance of hotels in a financial perspective, using the concept of indebtedness. The indebtedness represents, in this way, the financial sustainability of the hotels studied. The concept of sustainability is seen as one of the main concerns of an organization, which is related to the processes of transformation of the main areas of activity of a company, with respect to the business model, its strategy and operations, which aims to make the organization more competitive and achieve its financial goals (De Grosbois, 2012; Van Passel, Van Huylenbroeck, Lauwers, & Mathijs, 2009). However, the analysis developed in our research relates to the sustainability concept in a financial perspective, looking to analyze which variables may influence the financial sustainability of the hotel enterprises, being analyzed in the perspective of their indebtedness (total liabilities *versus* total assets). This issue assumes great relevance, since the financial performance of a business depends on its ability to generate revenues and maintain stability in business continuity.

Considering the present theoretical framework, which demonstrates the need to take into consideration the economic cycles in the financial performance of organizations, as well as the data presented that reflect the weight of the tourism sector in Portuguese GDP, the purpose of this study is to answer the following research question: 'RQIs there a relationship between the corporate growth rate of hotel companies, the corporate size of hotel companies, the number of guests of hotel companies, the tourism revenues of hotel companies, the total income of hospitality industry, and the indebtedness of the companies of the hotel sector?

The growing tourist demand registered in Portugal, over the last years, led to significant adjustments in installed capacity and the necessary investments that may have contributed, despite the undisputed benefit to the Gross Capital Formation, to higher levels of indebtedness. The objective of this study is to analyze the possible relationships between these variables and the financial performance of Portuguese hotel companies, namely the level of their indebtedness, obtained by the total liabilities/total assets ratio.

The various stakeholders of a company, for example, managers and investors, use various types of indicators to evaluate company performance and highlight areas for improvement. The study developed by Sainaghi (2010), in which this author reviewed around a hundred investigations on hotel management, identified three dimensions on the performance of the hotel industry, namely, financial, operational, and organizational. In this sense, several types of financial and operational indexes have been developed and widely used by researchers. The measures that best represent the financial performance of the hotel industry are liquidity, solvency, activity, profitability and operating indexes (Jagels, 2007, Andrew & Schmidgall, 1993). While liquidity ratios measure the company's ability to meet its short-term obligations, activity ratios measure the firm's efficiency in managing its assets. On the other hand, profitability ratios evaluate the overall performance of the company's ability to generate revenue and its return on revenue and investment.

Thus, this research considered as a dependent variable the total liabilities *versus* total assets ratio, to highlight the financial sustainability of companies, representing this sustainability a direct relationship with their financial performance. This indicator shows the proportion of total assets that are financed with liabilities, and the lower this indicator, the greater security it transmits to its creditors, since it will show less financial risk. According to Jagels (2007), the hotel sector presents values between 0.60 and 0.90.

Thus, five independent variables were considered. Two of those variables refer to the internal perspective of organizations and the remaining three to external and macroeconomic indicators. Regarding the internal indicators, the corporate growth rate (CGR) was considered, given by the total revenues of one year in relation to the previous one, and the corporate size variable (CS), given by the total sales of each hotel corporation. Regarding external variables, the following indicators were considered:

- Tourism revenue (TR), being considered in this variable the tourism revenues of the Ïravel and Tourismïtem of the Balance of Payments, through the data provided by PORDATA (2016). The travel and tourism balance includes the goods and services purchased from an economy by travelers, during visits of less than one year to that economy. The export is mainly the sale of goods and services abroad. Expenses incurred by foreign tourists in the country, such as those incurred in hotels, restaurants or leisure establishments, are considered as exports.
- Number of guests (NG), that is, individuals who spend at least one night in a tourist accommodation establishment, being considered in this category the hotels from one to five stars, hotels-apartments, tourist villages, tourist apartments, and others, through the data provided by PORDATA (2016).
- Total Income of the Hospitality Industry (TIHI) refers to total income of hotel establishments, that is, establishments whose main activity is the provision of accommodation services and other ancillary or support services. The hotel establishments are classified in hotels, pensions, inns, hotels, and aparthotels. For statistical purposes holiday villages and apartments are also included (PORDATA, 2016).

In this sense, five hypotheses of investigation were defined:

H1. The corporate growth rate of hotel companies has a significant impact on the indebtedness of the companies in the sector.

H2. The corporate size of hotel companies has a significant impact on the indebtedness of companies in the sector.

H3. The number of guests of hotel companies has a significant impact on the indebtedness of the companies in the sector.

H4. The tourism revenues of hotel companies have a significant impact on the indebtedness of the companies in the sector.

H5. The total income of the hospitality industry has a significant impact on the indebtedness of the companies in the sector.

Completed the description of the fundamentals that took to the construction of the initial issues through the literature review, the next section will describe the study.

3.2. Description of the study

This research intends to evaluate the impact of some variables, defined in this study as independent variables, in the performance of some Portuguese hotel companies, being this performance represented by an indicator of indebtedness, in the period between 2007 and 2014. Independent variables include the growth rate of hotel companies, the size of hotel companies, the total number of guests, total tourism revenues, and total revenues of the sector, while the dependent variable consists of the indebtedness of the companies in the sector, given by the ratio total liabilities/total assets.

Data on the independent variables were obtained from the Portuguese Statistical Institute, Bank of Portugal, and Tourism of Portugal, available on the PORDATA (2016) database. Regarding the information about the dependent variable, is used the indicator related to the indebtedness of tourism companies, given by the ratio total liabilities/total assets. The data referring to the companies were taken from the database *Sistema de Análisis de Balances Ibéricos* (SABI), and the sample was restricted to certain criteria to obtain several companies feasible for the investigation. The first criterion consisted in the selection of companies from codes 551 Ḧotel Establishmentsänd 552 Řesidences for holidays and other short stay", taking into consideration the Portuguese classification of economic activities (CAE - Rev.3). In this framework, the SABI database provided information on 503 companies, however, for the research sample, only the companies with financial information available between 2007 and 2014, with all known values available for consultation were selected. In this way, the final sample consisted of 275 companies and the data processing was performed with the statistical treatment software SPSS (Statistical Package for the Social Sciences).

3.3. Estimation of the research model

This research, taking as reference that the characteristics that distinguish the companies, understood as b̈asic statistical units", may or may not be constant over time, was made with the estimation with panel data. Baltagi (2005) and Hsiao (1986) argued that the panel data methodology can control for an individual corporation's heterogeneity, to reduce problems associated with multicollinearity and estimation bias and specify the time-varying relation between dependent and independent variables. This type of study suggests the existence of individual characteristics, since the use of temporal or sectional studies, which do not consider heterogeneity, will almost always produce skewed results. It can also be considered that the panel data provide a greater amount of information, greater variability of the data, lower collinearity among the variables, the greater number of degrees of freedom and greater efficiency in the estimation of the model. In these models, a double assignment data set (two indices) is considered. The data relate to each of several cross-section units observed, over several periods of time. In the study, the different sectional units are the companies (total of 275 companies) and the time periods are the years (8 years, from 2007 to 2014). This means that, for the observable variables

present in the model, data are obtained which are the numerical values that each of the 275 companies registers over 8 years.

In the study of this data structure, emphasis will be placed on the sectional units, in the sense that different behaviors are allowed for the different sectional units, but whose behavior, however, will not vary with time – is, in this respect, constant. It should be noted that the number of periods is relatively short in relation to the number of companies. According to Greene (2008), a panel data set consists of n sets of observations of the subjects which are described as $i = 1...$ N. About the characterization of the panel data type, it is verified that each subject in the data set is observed the same number of times, usually described as T (years of the study), so the data set is presented as a balanced panel. We can also explain that the sample of this study is provided to be studied as a balanced panel model with fixed effects. Still, according to Greene (2008), the fixed effects regression model arises from the fact that, although the intercept may differ between individuals, each individual intercept does not change over time, that is, it is constant in time.

3.4. Characterization of the variables used in the model

Table 1 presents some descriptive statistical measures characterizing the variables used in the study. The standard deviation is high in the CI, CGR and CS variables, evidencing that the sample includes companies with very different dimensions, being very heterogeneous. However, the NG, TIHI and TR variables show a smaller variation.

In Table 2 it is possible to observe that there is no statistically significant relationship between the CI variable and the remaining variables. It is verified that, except for the CGR variable, the remaining variables have a negative association, which indicates that the increase of one implies a decrease in the other. In this case, higher values in the CS, NG, TIHI and TR variables will result in lower values in the CI variable. Table 2 also allows to verify the existence of three linear correlations, statistically significant, namely, TIHI-NG; TR-NG and TR-TIHI, and a strong positive linear association between TR and NG.

The existence of multiple outliers in the different variables, forces the statistical analysis of equality of averages over the time of the study. Thus, there is no statistical evidence to assert that the mean of CI is significantly different between the eight years under analysis ($F(7,2192) = 0.1517$; p-value $= 0.9937$), that is, although there are discrepant values, the average of CI is similar throughout the study, not standing out any of the years. Verification of the homogeneity of variances was made using the *Levene* test and the *Brown–Forsythe* test, which certifies that there are no statistically significant differences, because it is verified that *Levene* $(7,2192) = 0.721$; p-value $= 0.653$ and *Brown–Forsythe* $(7,2191) = 0.514$; p-value $= 0.824$, being verified that the variance of CI is identical in the eight years (Table 3).

In the study of the CGR variable it is verified that there is statistical evidence to assert that its mean is significantly different over time under analysis ($F(7,2192) = 2.97$; p-value $= 0.0042$), which means that there are statistically significant variations between the years 2007 and 2014. The variance in the CGR variable presents statistically significant differences, because it turns out that *Levene* $(7,2192) = 7.047$; p-value $= 0.000$ and *Brown–Forsythe* $(7,2191) = 2.044$; p-value $= 0.046$, denoting that it is not constant in the eight years. Also, in the CS variable there is no statistical evidence to assert that the mean is significantly different in the eight years under analysis ($F(7,2192) = 0.526$; p-value $= 0.815$). In the study of the variance behavior of the CS variable, it was found that there is statistical evidence to assert that it does not reveal significantly different over time, revealing the

Table 1
Descriptive statistics of the variables used in the study.

	CI	CGR	CS	NG	TIHI	TR
Mean	67.71360	21.61644	4,137,151.	13,944,349	1,913,167.	8,218,244.
Median	62.41450	0.337506	2,079,251.	13,691,230	1,924,798.	7,873,415.
Maximum	821.5990	11,432.29	66,635,840	16,057,142	2,108,627.	10393920
Minimum	1.170000	−96.36670	5648.750	12,927,907	1,763,954.	6,907,843.
Std. Dev.	55.06576	319.0274	6,392,858.	896,748.5	100,135.4	1,079,711.
Skewness	6.143428	27.47996	4.948061	1.401788	0.376120	0.790412
Kurtosis	62.10027	875.0322	35.13931	4.106148	2.614381	2.528404
Observations	2200	2200	2200	2200	2200	2200

Table 2
Pearson's correlation between the variables under study.

	CI	CGR	CS	NG	TIHI	TR
CI	1.000000					
CGR	0.043485	1.000000				
CS	−0.058106	−0.001364	1.000,000			
NG	−0.010946	0.057863	0.020098	1.000000		
TIHI	−0.011166	0.074704	0.035335	**0.818803**[**]	1.000000	
TR	−0.006528	0.043440	0.014161	**0.959761**[**]	**0.743003**[**]	1.000000

[**] Correlation is significant at the 0.01 level (2-tailed)

Table 3
Test for equality of means and variances categorized by values of DATEID.

Test for equality of means of CI				Test for equality of variances of CI			
Sample: 2007 2014				Sample: 2007 2014			
Included observations: 2200				Included observations: 2200			
Method	df	Value	Probability	Method	df	Value	Probability
Anova F-test	(7, 2192)	0.151723	0.9937	Levene	(7, 2192)	0.721343	0.6539
Welch F-test[a]	(7, 936.514)	0.146964	0.9943	Brown–Forsythe	(7, 2192)	0.514362	0.8243
Test for equality of means of CGR				Test for equality of variances of CGR			
Sample: 2007 2014				Sample: 2007 2014			
Included observations: 2200				Included observations: 2200			
Method	df	Value	Probability	Method	df	Value	Probability
Anova F-test	(7, 2192)	2.970295	0.0042	Levene	(7, 2192)	7.047423	0.0000
Welch F-test[a]	(7, 910.243)	2.499446	0.0151	Brown–Forsythe	(7, 2192)	2.044146	0.0464
Test for equality of means of CS				Test for equality of variances of CS			
Sample: 2007 2014				Sample: 2007 2014			
Included observations: 2200				Included observations: 2200			
Method	df	Value	Probability	Method	df	Value	Probability
Anova F-test	(7, 2192)	0.526190	0.8153	Levene	(7, 2192)	0.706928	0.6662
Welch F-test[a]	(7, 939.143)	0.499187	0.8355	Brown–Forsythe	(7, 2192)	0.373146	0.9183

[a] Test allows for unequal cell variances.

results *Levene* (7,2192) = 0.706; *p*-value = 0.666 and *Brown–Forsythe* (7,2191) = 0.373; *p*-value = 0.918.

3.5. Implementation of the model

The confirmation of the existence of high variation in the data, in some variables, suggests the use of a transformation, more specifically a logarithmic transformation. Consider that the equation in which the dependent variable – in the study is the *neperian* logarithm of corporate indebtedness – is determined by five major factors: the set of explanatory variables (assumed as deterministic) grouped in vector X, which has associated the parameter vector β'; the specific effect for each unobservable sectional unit (companies), also called latent variable, α_i; and the term of disturbance with respect to unobservable errors ε_{it}.

Thus, the econometric model is as follows:

$$Y_{it} = \beta'X_{it} + \alpha_i + \varepsilon_{it}$$

It being understood that:
$Y_{it} = Ln(CI_{it})$, *neperian* logarithm of corporate indebtedness i in year t; $i = 1, 2,..., n_b$; the index i represents each of the sectional units, that is, each of the companies, which are in total $n_b = 275$ companies; $t = 1,2,..., 8$; the index t represents the time, in this case the year to which the information relates, in the study are considered 8 years, from 2007 to 2014.

In this formulation, the unobservable (or latent) specific effect that plays an important role in the model logic and which has consequences on estimation procedures is considered. It should be noted, therefore, that this term be a substitute for the set of individual

factors characteristic of each company. This means that, by having this specific effect in consideration and econometric point of view, an error of omission of relevant explanatory variables is avoided, which means that the conventional estimation by the Ordinary Least Squares (OLS) method would not be adequate, considering the bias, inefficiency and inconsistency of the OLS estimators, by not considering the unobservable effect.

However, a question arises on how to incorporate this specific latent effect not observable in the model. Thus, the two models will be assumed: the fixed effects model and the random effects model, as is usual in the literature.

In the fixed effects model, we consider the following model:

$$Y_{it} = \alpha_i + \beta'X_{it} + \varepsilon_{it}$$

It is assumed that the specific sectional factor α_i is correlated with the observable explanatory variables present in the $\beta'X_{it}$. The model considers for each sectional unit (each company) a specific constant term, that does not vary with the time.

3.6. Estimation of the model as a panel of constant coefficients

The results of the data panel adjustment, without the fixed effects or weights (Table 4), show a low level of joint and individual significance of the estimated coefficients, not revealing the model statistically significant. The *statistic F* = 1.388 presents a p-value = 0.226 > 0.05. The model presents itself with the constant C (p-value = 0.0403) and the variable LNG (p-value = 0.0418) with a statistically significant significance, a very low coefficient of determination (R^2 = 0.006186), and *Durbin Watson* statistic also low (*DW stat* ≈ 0.09).

Table 5 shows the results of the verification of the heteroskedasticity between the cross-sections, observing that the equality of residual variances in the different cross-sections is not accepted (p-value <0.05), which means that there is heteroscedasticity between the cross-sections.

In addition to heteroscedasticity problems, the model also presents autocorrelation problems. To overcome the problems of heteroscedasticity and autocorrelation, an *AR (1)* structure was inserted in the residues. The effects obtained, shown in Table 6, reveal an acceptable *Durbin Watson* statistic very close to two, a reasonable joint significance of the variables, and a good value of R^2 = 0.880572. Although individual significance has been lost, the specific case of the variable LNG, the model with a statistic F = 517.3566 and a p-value = 0.000 < 0.05 reveals itself statistically significant.

The panel of estimated constant coefficients, without heteroscedasticity and autocorrelation, is the following:

$$LCI = 0.00704 * LCGR - 0.01013 * LCS - 0.75578 * LNG$$
$$+ 0.68312 * LTIHI - 0.05481 * LTR + 7.56616 + [AR(1)$$
$$= 0.94415]$$

3.7. Estimation of the general model of fixed effects

The estimation of the panel with the effects of cross-sections (effects of the companies) and without fixed effects of time was made using the structure *AR (1)* in the residues. The model presents itself with a low individual significance, but with a value of F = 22.385 and a p-value = 0.000 < 0.05 which implies a good joint significance. The statistical values shown in Table 7 reveal an acceptable statistic of *Durbin Watson* (2.95), a reasonable joint significance of the variables and a good value of R^2 = 0.958188.

Table 8 shows that there is no heteroskedasticity between the cross-sections (company effects) and no fixed effects of time,

observing that only the *Bartlett test* (p-value = 0.0477 ≈ 0.05) reveals itself statistically significant. However, the residual equality of variances in the different cross-sections is accepted.

The typification of the fixed effects of the companies, of being or not being equal, was made using the test of maximum likelihood for the redundancy of fixed effects. Thus, with 95% confidence, it is verified that *p-values* smaller than 0.05 (*Cross-section F* $_{(274.841)}$ = 13.292; p-value = 0.000) and (*Cross-section Chi-square* $_{(274)}$ = 1875.97; p-value = 0.000) lead to conclude that the fixed effects of enterprises are different (Table 9).

According to the results of Tables 7–9, the equation of the adjusted fixed-effects model is as follows:

$$LCI = 0.0041 * LCGR - 0.0231 * LCS - 0.3248 * LNG$$
$$+ 0.2484 * LTIHI - 0.1273 * LTR + 8.1371 - 0.3939 * d_1$$
$$+ 0.1364 * d_2 + 0.2662 * d_3 \ldots + [AR(1) = 0.6465]$$

(d_i = 1 for observations of enterprise i, and d_i = 0 otherwise).

3.8. Final considerations

In macroeconomic studies, since it is impossible to have a sample of N enterprises as a random selection of a population with dimension tendentially infinite, a general model of fixed effects is used, since it is indifferent to consider the sample as random or not. This research took as a reference a group of 275 companies, implying that all inference of the study is conditioned to the specific group under observation, being possible to point out some conclusions, both from the perspective of academic research, as well as for the orientation of the companies under study.

Thus, the results of the econometric estimations are highlighted: the model shows a weak individual significance. However, the value of F = 22.385 and a p-value = 0.000 < 0.05 indicate a good overall significance, from which it can be concluded that 91.5% of the average variation in the variable CI is determined by the remaining variables of the study, with the remaining 8.5% variation explained by other factors not specified. It is concluded, quite consistently, that there is no statistically significant difference between the values of the CI variable throughout the study, existing a negative relation between this variable and the variables CS, NG, and TR, and a positive relation with the variables CGR and TIHI. These econometric results allow to corroborate the one observed in preliminary graphical analyzes. Among the coefficients estimated in the model, it is worth noting that among the most relevant transformed variables, the variable LNG has the largest negative contribution, that is, is the one that most will help to reduce corporate indebtedness and the variable LTIHI a positive contribution, indicating that the greater its value the greater the company's indebtedness.

Since the dependent variable and the explanatory variables are logarithmic transformations of the study variables, the coefficients of the independent variables can be interpreted as the percentage variation of the dependent variable for a variation of one unit in absolute terms in an explanatory variable, keeping the other variables x's constant or with their effects controlled. Thus, by increasing one unit in the variable LCGR, the company increases its indebtedness by 0.41%. The negative coefficient and not statistically significant of the variables LCS, LNG and LTR indicates that the increase in one unit, separately and keeping the others constant, reduces the company's indebtedness by 2.32%, by 32.48%, and by 12.7%, respectively. In the analysis of the variable LTIHI, its increase in one unit, although not statistically significant, increases the company's indebtedness by 24.8%.

The coefficient of the artificial variable of residues *AR (1)* has only as a function to correct the estimated coefficients and the standardized errors, however, does not affect them. It means that it appears

Table 4
Model as a panel of constant coefficients.

Dependent variable: LCI
Method: panel least squares
Sample: 2007 2014
Periods included: 8
Cross-sections included: 275
Total panel (unbalanced) observations: 1121

Variable	Coefficient	Std. error	t-Statistic	Prob.
LCS	−0.028965	0.020666	−1.401583	0.1613
LNG	−2.734694	1.404764	−1.946729	0.0418
LTIHI	0.870421	0.720173	1.208628	0.2271
LTR	1.011487	0.626719	1.613940	0.1068
LCGR	0.008641	0.013767	0.627630	0.5304
C	20.70212	10.08179	2.053417	0.0403

R-squared	0.006186	Mean dependent var	3.994550	
Adjusted R-squared	0.001730	S.D. dependent var	0.680812	
S.E. of regression	0.680223	Akaike info criterion	2.072546	
Sum squared resid	515.9145	Schwarz criterion	2.099426	
Log likelihood	−1155.662	Hannan-Quinn criterion	2.082706	
F-statistic	1.388113	Durbin-Watson stat	0.089929	
Prob(F-statistic)	0.226024			

Table 5
Test of equality of variances of residues in a panel of constant coefficients.

Test for equality of variances of RESID
Categorized by values of RESID
Sample: 2007 2014
Included observations: 1121

Method	df	Value	Probability
Bartlett	3	159.9381	0.0000
Levene	(3, 1117)	52.66513	0.0000
Brown–Forsythe	(3, 1117)	33.41071	0.0000

Category statistics

RESID	Count	Std. dev.	Mean abs. Mean diff.	Mean abs. Median diff.
[−4, −2)	18	0.560304	0.477969	0.460674
[−2, 0)	423	0.457063	0.362259	0.343886
[0, 2)	675	0.267401	0.198013	0.196535
[2, 4)	5	0.235691	0.200050	0.179880
All	1121	0.678703	0.264494	0.256304

Bartlett weighted standard deviation: 0.356436.

in the regression equation to indicate the order of the model, but it is not considered when it makes a prediction.

4. Conclusions

This paper intends to contribute to the reinforcement of this line of research, analyzing some macroeconomic variables with economic and financial indicators that can assess, in an accurate way, the financial performance of companies in the hotel sector. In this sense, a research model was proposed to respond to the research questions.

The tourism and hotel sector is an increasingly global, dynamic and competitive area, which has led to an increase in international competitiveness. Thus, the hotel industry, in general, is immersed in a highly competitive environment and its managers need accurate and reliable information for the proper management of the activities. Hotel companies, like any other organization, can use financial measures or indicators to generate information for the decision-making process of their managers in order to improve business performance. The results obtained should allow companies in the hotel industry to promote an adequate return to their shareholders and investors, pay creditors and adequately

reward employees, and sustain growth. Consequently, to maintain a level of performance that provides the expected result, managers need a broad knowledge of operational variables and the macroeconomic environment that allows them to make the best decisions.

Although the role of tourism is undoubtedly relevant in any economy, the studies developed previously have been scarce and insufficient in what concerns the analysis of the performance of the tourism industry and the main variables that determine the financial sustainability of hotels. In this way, this research analyzed the relationship of cause effects among several independent variables, some internal and referring to the companies studied, and others referring to macroeconomic variables.

The macroeconomic context is an extremely important factor for the growth and development of companies, and for the hotel sector. So, the changes that take place in the markets in which these companies operate will have a major impact on what concerns the expansion or contraction of their businesses (Dritsakis, 2004; Fayissa et al., 2008; Lee & Chang, 2008; Proenca & Soukiazis, 2008; Chen, 2010). In this way, it is expected that the performance of hotel companies should be strongly dependent on the conditions and the macroeconomic environment where they are inserted.

Table 6
Model as a panel of constant coefficients with structure AR (1).

Dependent variable: LCI
Method: panel least squares
Sample (adjusted): 2008 2014
Periods included: 7
Cross-sections included: 211
Total panel (unbalanced) observations: 428
Convergence achieved after 7 iterations

Variable	Coefficient	Std. error	t-Statistic	Prob.
LCGR	0.007044	0.005142	1.369839	0.1715
LCS	−0.010137	0.022914	−0.442412	0.6584
LNG	−0.755787	0.473766	−1.595277	0.1114
LTIHI	0.683127	0.405965	1.682722	0.0932
LTR	−0.054819	0.358304	−0.152995	0.8785
C	7.566164	3.406923	2.220820	0.0269
AR (1)	0.944151	0.017052	55.36782	0.0000

R-squared	0.880572	Mean dependent var	4.025334	
Adjusted R-squared	0.878870	S.D. dependent var	0.564022	
S.E. of regression	0.196301	Akaike info criterion	−0.402119	
Sum squared resid	16.22279	Schwarz criterion	−0.335732	
Log likelihood	93.05349	Hannan–Quinn criterion	−0.375900	
F-statistic	517.3566	Durbin–Watson stat	1.714710	
Prob(F-statistic)	0.000000			
Inverted AR roots	.94			

Table 7
General model of fixed effects.

Dependent variable: LCI

Method: panel least squares
Sample (adjusted): 2008 2014
Periods included: 7
Cross-sections included: 211
Total panel (unbalanced) observations: 428
Convergence achieved after 7 iterations

Variable	Coefficient	Std. error	t-Statistic	Prob.
LCGR	0.004120	0.006376	0.646220	0.5188
LCS	−0.023200	0.028393	−0.817079	0.4148
LNG	−0.324872	0.616836	−0.526674	0.5990
LTIHI	0.248431	0.401150	0.619298	0.5364
LTR	−0.127343	0.366760	−0.347210	0.7288
C	8.137111	3.937681	2.066473	0.0400
AR (1)	0.646533	0.053087	12.17865	0.0000

Effects specification

Cross-section fixed (dummy variables)

R-squared	0.958188	Mean dependent var	4.025334	
Adjusted R-squared	0.915384	S.D. dependent var	0.564022	
S.E. of regression	0.164067	Akaike info criterion	−0.470332	
Sum squared resid	5.679685	Schwarz criterion	1.587682	
Log likelihood	317.6510	Hannan–Quinn criter.	0.342470	
F-statistic	22.38590	Durbin–Watson stat	2.952008	
Prob(F-statistic)	0.000000			
Inverted AR roots	.65			

Based on the literature review, the development of tourism can significantly improve the business environment, which has a direct and an indirect effect on the business performance of hotel companies (Balaguer & Cantavella-Jorda, 2002; Dritsakis, 2004; Gunduz & Hatemi-J, 2005; Kim et al., 2006). Following these ideas underlying the assumptions of hotels performance, this research analyzed the relationship between the index of growth of the hotel companies, the size of hotel companies, the total number of guests in the sector, total revenues, and the total income of the sector, with the dependent variable of the research, described by the financial performance of Portuguese hotel companies, considering their indebtedness, being the indebtedness indicator calculated by the total liabilities/total assets ratio.

Concerning the results obtained, it is possible to conclude that the model shows a weak individual significance. However, the value of $F = 22.385$ and a p-value $= 0.000 < 0.05$ indicate a good overall significance, from which it can be concluded that 91.5% of the average variation in the variable CI is determined by the remaining variables of the study, with the remaining 8.5% variation explained by other factors not specified. It is concluded that there is no statistically significant difference between the values of the CI variable throughout the study, existing a negative relation between this variable and the variables CS, NG, and TR, and a positive relation with the variables

Table 8
Test of equality of variances of the residues in the general model of fixed effects.

Test for equality of variances of RESID			
Categorized by values of RESID Date: 11/30/15 time: 16:05 Sample (adjusted): 2008 2014 Included observations: 428 after adjustments			

Method	df	Value	Probability
Bartlett	2	6.554176	0.0477
Levene	(2, 425)	3.128222	0.0548
Brown–Forsythe	(2, 425)	1.218169	0.2968

Category statistics				
RESID	Count	Std. dev.	Mean abs. Mean diff.	Mean abs. Median diff.
[−0.5, 0)	202	0.097989	0.071252	0.061972
[0, 0.5)	225	0.082186	0.057331	0.051635
[0.5, 1)	1	NA	0.000000	0.000000
All	428	0.115332	0.063767	0.056393

Bartlett weighted standard deviation: 0.090007.

Table 9
Tests of redundant fixed effects.

Test cross-section fixed effects			
Effects test	Statistic	d.f.	Prob.
Cross-section F	13.292353	(274,841)	0.0000
Cross-section Chi-square	1875.970467	274	0.0000

Cross-section fixed effects test equation:
Dependent variable: LCI
Method: panel least squares
Sample: 2007 2014
Periods included: 8
Cross-sections included: 275
Total panel (unbalanced) observations: 1121

Variable	Coefficient	Std. error	t-Statistic	Prob.
LCGR	0.008641	0.013767	0.627630	0.5304
LCS	−0.028965	0.020666	−1.401583	0.1613
LNG	−2.734694	1.404764	−1.946729	0.0418
LTIHI	0.870421	0.720173	1.208628	0.2271
LTR	1.011487	0.626719	1.613940	0.1068
C	20.70212	10.08179	2.053417	0.0403

CGR and TIHI. Among the coefficients estimated for the model, it is worth noting that among the most relevant transformed variables, the variable LNG has the largest negative contribution, that is, is the one that most will help to reduce corporate indebtedness and the variable LTIHI a positive contribution, indicating that the greater its value the greater the company's indebtedness. By increasing one unit in the variable LCGR, the company increases its indebtedness by 0.41%. The negative coefficient and not statistically significant of the variables LCS, LNG, and LTR indicates that the increase in one unit, separately and keeping the others constant, reduces the company's indebtedness by 2.32%, by 32.48% and by 12.7%, respectively. In the analysis of the variable LTIHI, its increase in one unit, although not statistically significant, increases the company's indebtedness by 24.8%.

We consider that this research provides a great contribution and enrichment of existing literature, and also in a practical perspective because with a detailed knowledge concerning some macroeconomic variables and characteristics of the hotels, analyzing the impact that those variables have on the financial performance of those corporations, managers' can base their decision making on these cause and effect relationships, looking for the best alternatives and decisions that will provide the highest profitability.

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