Are hotel companies creditworthy? the case of Portuguese hospitality industry

Ricardo Pãozinho[a], Luís Lima Santos[b], Conceição Gomes[c] and Cátia Malheiros[d]

[a b c d] CiTUR - Centre of Tourism Research, Development and Innovation
Escola Superior de Turismo e Tecnologia do Mar, Santuário N. S.ra dos Remédios, 2520-641 Peniche

[a] 4170480@my.ipleiria.pt

[b] llsantos@ipleiria.pt

[c] conceicao.gomes@ipleiria.pt

[d] catia.malheiros@ipleiria.pt

Abstract

The hospitality industry achieved an important place in modern economies, namely in terms of the contribution to the GDP and for direct and indirect employment. Considering that, this paper aims to highlight the hotel companies' level of solvency, as a sustainability factor in an extremely competitive sector.

The main structure ratios of Portuguese Hotels in the 2010-2017 period will be analyzed; data was collected on July 4, 2019, on the SABI platform and the original sample is composed by 2161 hotel companies registered with two economic activity codes (CAE), "55111 - Hotels with restaurant" and "55121 - Hotels without restaurant".

The structure ratios, also known as debt ratios, highlight the importance of financing sources (resources), as well as the way in which financing is applied (applications). On the other hand, capital raising by companies, whether they are from the hospitality sector or not, should be carried out at the lowest cost in order to maximize their value. For the hotelier, it is essential to have his company balanced in the medium and long term; that is the reason why the investment coverage ratio, the fixed assets coverage ratio, the financial autonomy ratio and the solvency ratio were considered in the analysis.

It is expected to obtain results that help hospitality managers understand the importance of the solvency and to guide the management for the financial sustainability in the medium and long term.

Keywords: Financial sustainability; solvency; creditworthy; hotel companies; hospitality industry.

Introduction

The growing significance of the hospitality industry in Portugal, associated with the increase in the number of players and the consequent need for the hoteliers to be more competitive and efficient give the management accounting an increasing importance in the sector. Certain management accounting practices and techniques in hospitality are unique as it is an industry with distinctive characteristics and capital intensive. One of the main techniques used in the management accounting is the calculation of financial ratios which translate significant relations for a company to ensure its short, medium- and long-term financial sustainability.

Given that the analysed period (2013-2017) was a period of significant growth in the touristic sector, in Portugal, companies need to ensure prosperity and succeed during most difficult times. That can only be made if those companies have access to certain information that can ensure them, they are able to face their long-term responsibilities. In order to respond to that need, results coming from solvency ratios should be calculated, interpreted and analysed. Those include the financial autonomy

ratio, the fixed assets coverage ratio, the investment coverage ratio and the solvency ratio.

The main goal of this study is to ascertain and assess the level of creditworthy in the Portuguese hospitality industry; in order to allow a more complete analysis; differences by region will be underline and the relation between hotels, with and without restaurant, in terms of financial structure ratios.

Literature Review

According to the UNWTO Annual Report (2018), "2017 was a record year for international tourism. For the eighth consecutive year, international tourist arrivals grew, which constitutes "a sequence of uninterrupted growth not recorded since the 1960s. Destinations worldwide welcomed 1,323 million international tourist arrivals, some 84 million more than in 2016", which translates the worldwide growing importance of tourism, in general, and hotel companies, in particular.

Focusing in Portugal, the country is increasingly more focused on the tourism sector, investing increasingly on the quality of its touristic services and infrastructures and, on the other hand, in the diversification and qualification of the touristic supply (Pinto, 2008). Proving that, the election of Portugal as the world´s best touristic destination for the 3rd consecutive year, in the World Travel Awards.

It is fundamental to comprehend the incentives tourism presents that appeal to private investors and the elements that ascertain post-entry performance (Gémar, Moniche, & Morales, 2016). Those should be meaningful, realistic and understandable (Jagels & Coltman, 2004). As they express meaningful connections, ratios take an important portion in the hospitality financial statements, particularly at the income statement (Cote, 2012). However, a ratio, by itself, is neutral, as it only expresses numerical relationships between the presented figures. For a ratio to become meaningful and a basis for the evaluation of financial conditions, there must be a standard. In such context, financial ratios assume a significant importance, as they can express multiple logical relationships between one or two financial statements (Schmidgall & Damitio, 2006).

Schmidgall & Damitio (2006) state that we can identify the existence of three main categories of ratio standards, in the hospitality industry: planned ratio goals; comparison of results from a prior period; comparison to the industry average. The first kind of ratio standards are the ones we should implement, preferentially, as they allow us to plan, organize, implement and control the effectiveness of certain measures, in time.

Ratios are fundamental, as they "help a business entity evaluate financial and economic results of profit-oriented operations over a given accounting period" (Jagels & Coltman, 2004) as well as "to maintain a fairly accurate perception of the effectiveness and efficiency of their operations" (Schmidgall & Damitio, 2006).

According to some authors, there are five main types of ratios, in the hospitality industry: Liquidity ratios; Structure ratios, also known as debt or solvency ratios, which we will approach in detail in this paper; Profitability ratios; Activity ratios and Operating ratios.

Liquidity ratios, by its turn, state the capacity of a certain business to accomplish its commitments on the short-term (Jagels & Coltman, 2004).

Structure ratios translate if a certain company has been financed through debt and, most importantly, if it is able to meet its long-term responsibilities (Schmidgall & Damitio, 2006).

Profitability ratios allow assessing the ability to return the investment, both to owners and financiers (Santos et al., 2016).

Activity ratios, as the name indicates, reflect the ability of the management in the use of company´s assets and resources (Schmidgall & Damitio, 2006).

Lastly, the Operating Ratios allow measuring effectiveness and efficiency of operations (Cote, 2012), such as rooms, food and beverage operations (Jagels & Coltman, 2004).

Concerning about structure ratios, Li & Singal (2019) identified, through literature review, the existence of multiple significant determinants of capital structure, such as the cost of financial distress, the impact of taxes and the costs and benefits that result from debt and equity. Two major theories are proposed: Trade-off theory and pecking order theory.

Trade-off theory defends that capital structure decisions do not impact the firm's worth and that the cost of capital remains unaffected no matter the level of debt (Modigliani & Miller, 1958). Companies tend to adjust current debt, heading for its optimal level (Kim, 1978) by "balancing debt tax-

shields against bankruptcy costs" (Serrasqueiro & Nunes, 2014).

Pecking order theory, on the other hand, states that variations in debt happen, entirely, according to the firms' financing demands, which means that variations in debt occur in accordance with the financial deficit recognized at a certain point in time (Shyam-Sunder & C. Myers, 1999).

Focusing in Portugal, Serrasqueiro & Nunes (2014) state that structure ratios can reveal a lot about the future of a hospitality enterprise, as the majority of hotels, in Portugal, belong to Small and Medium Enterprises (SME) which are capital intensive firms that have a considerable level of fixed assets which, on one hand, allow an easier access to debt due to the capacity to provide guarantees to creditors but, on the other, can increase the firm risk, in result of high volatility of earnings caused by high fixed costs.

Methodology

A summarized literature review was conducted, concerning the matters of financial ratios in general, its importance and the main categories of ratio standards, as well as the main categories of ratios concerning hospitality industry, particularly focusing on structure ratios.

Data was collected on July 4, 2019, on the SABI platform, from Bureau Van Dijk (A Moody's Analytics Company), and the original sample was composed by 2161 hotel companies registered with two economic activity codes (CAE), "55111 - Hotels with restaurant" and "55121 - Hotels without restaurant" between 2010 and 2017. The main structure ratios of Portuguese Hotels in the 2013-2017 period were calculated, having been rejected 1503 companies in which data was not available, the data was incomplete (some companies started operating in the middle of the analysed period or ceased activity during that period) or by a set of multiple conditionings. In the end, the sample was established in 658 companies and the 2010-2012 period wasn´t considered in the analysis.

The main medium/long term financial ratios were calculated and analysed, in order to understand if Portuguese hotel companies have an adequate coverage of their investments with long-term financing and to confirm if their financing structure is balanced considering equity and liabilities.

The investment coverage ratio, it allows us to verify if companies´ equity covers the tangible and intangible fixed assets applications. This ratio, ideally, should be greater than 1. In that case, it meant that equity covered, and surpassed, the tangible and intangible fixed assets applications, concerning companies with CAE 55111 and 55121.

Complementarily, the fixed assets coverage ratio translates the portion of permanent capital (equity + non-current liabilities) that contributed to financing fixed assets. This ratio should be greater than 1, as it meant that the value of permanent capital surpasses fixed assets value.

When it is equal to 1, permanent capitals cover fixed assets completely.

If this ratio is less than 1, a non-recommendable situation, permanent capitals are not able to cover fixed assets, which means that fixed asset investments are made with short term capitals.

The Financial Autonomy Ratio mirrors the capacity of companies to agree on medium/long term loans backed by equity. This ability ends when non-current liabilities are levelled with equity, which means a ratio equal to 1. If a company has non-current liabilities superior to equity (in this case, the value of the ratio is less than 1), it means that the company compromises its financial autonomy.

Solvency ratio, on its turn, translates if a company is (or is not) solvent. If the ratio is less than 0.5, it means that equity, by itself, is not able to settle the liability, which means, ultimately, that the company can move towards insolvency.

The used formulas, in order to calculate the main financial medium/long term solvency ratios to be analysed, were the following:

$$\text{Investment Coverage Ratio} = \frac{\text{Equity}}{\text{Tangible Assets} + \text{Intangible Assets}}$$

$$\text{Fixed Assets Coverage Ratio} = \frac{\text{Permanent Capital}}{\text{Fixed Assets}},$$

being Permanent Capital = Equity + Non-Current Liabilities

$$\text{Financial Autonomy Ratio} = \frac{\text{Equity}}{\text{Non-Current Liabilities}}$$

$$\text{Solvency Ratio} = \frac{\text{Equity}}{\text{Liability}}$$

In order to understand the level of creditworthy in the Portuguese hospitality industry, the results highlight differences by region (district) which allows a more complete analysis. Lastly, it was studied the relation between the above typologies of financial structure ratios to companies with CAE 55111 and 55121.

Findings and discussion

In order to analyse the main structure ratios concerning Portuguese hotel companies, it is necessary to know, first, which type of companies are being analysed, by CAE. As stated earlier, two economic activity codes were analysed: "55111 - Hotels with restaurant" and "55121 - Hotels without restaurant", being the majority of the 658 hotels analysed (83.1%) hotels with restaurant.

Regarding the geographic distribution of the analysed companies, by district, we can highlight that the large majority of the companies were registered in Lisbon (22.6%, which corresponds to 146 from a total of 658 analysed companies), followed by Oporto (12.6%), Faro (11.2%) and Funchal (7.1%), in Autonomous Region of Madeira. This data matches the traditionally most touristic districts of Portugal. At the opposite end, we have the district of Angra do Heroísmo and Horta, at Autonomous Region of Azores, with only 0,5% and 0,8%, which corresponds to 3 and 5 hotel companies, respectively.

By relating economic activity codes with districts, we can highlight that, in all the Portuguese districts (except Angra do Heroísmo), companies with the economic activity code "55111 – Hotels with restaurant" surpass the companies with CAE "55121 – Hotels without restaurant", as we can state at table 1.

Table 1 – Relation between Districts and Economic Activity Codes

| | | Economic Activity Code (CAE) | | |
		55111	55121	Total
District	Angra do Heroísmo	0	3	3
	Aveiro	24	3	27
	Beja	7	6	13
	Braga	29	7	36
	Bragança	8	2	10
	Castelo Branco	10	1	11
	Coimbra	16	3	19
	Évora	10	1	11
	Faro	66	8	74
	Funchal	46	1	47
	Guarda	9	0	9
	Horta	3	2	5
	Leiria	24	6	30
	Lisboa	128	21	149
	Ponta Delgada	17	6	23
	Portalegre	9	0	9
	Porto	62	21	83
	Santarém	25	6	31
	Setúbal	15	6	21
	Viana do Castelo	14	5	19
	Vila Real	7	1	8
	Viseu	18	2	20
Total		547	111	658

Concerning the average of the values presented by our company´s sample (in thousands of euros), we can analyse them in 2 groups: In graphic 1, Equity; Non-current liabilities and total Liability, and, on graphic 2, Non-current assets; Tangible assets and Intangible assets.

It should be added that in this sample there are some outliers which sometimes leads to influence the average, which can be influenced positively or negatively.

In the first group, we can highlight that Equity had a continuous growth, from 2013 (3 901 €) to 2017 (5 239 €), which translates that Portuguese hotel companies net value increased in the analysed period. When it comes to non-current liabilities, in the course of the analysed period, it had an unstable

evolution, presenting, in 2013, a value of 4 409 €, and, in 2017, a value of 4 688 €, as it can be observed in graphic 1. Those constitute company´s responsibilities with a maturity of more than 1 year. Regarding liabilities, which are made by the sum of current liabilities and non-current liabilities, they presented an inconstant evolution, with the value of 6 664 €, in 2013, and 6 801 €, in 2017.

Graphic 1 – Average of the values presented by the companies
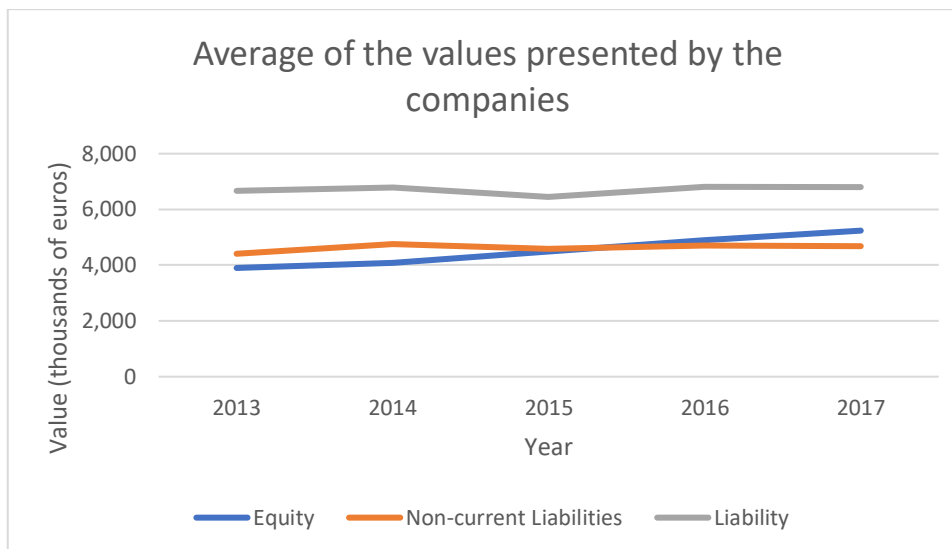
In the second group, relatively to non-current assets, they correspond to long-term assets and rights (over 1 year). By analysing graphic 2, it is possible to verify that there was an increase, between 2013 (9 152 €) and 2017 (10 148 €). On the other hand, tangible assets had a slight growth, from 7 188 €, in 2013, to 7 631 €, in 2017. Concerning intangible assets, despite having lower values, it presented a considerable evolution (53 €, in 2013, to 77 €, in 2017).

Graphic 2 – Average of the values presented by the companies
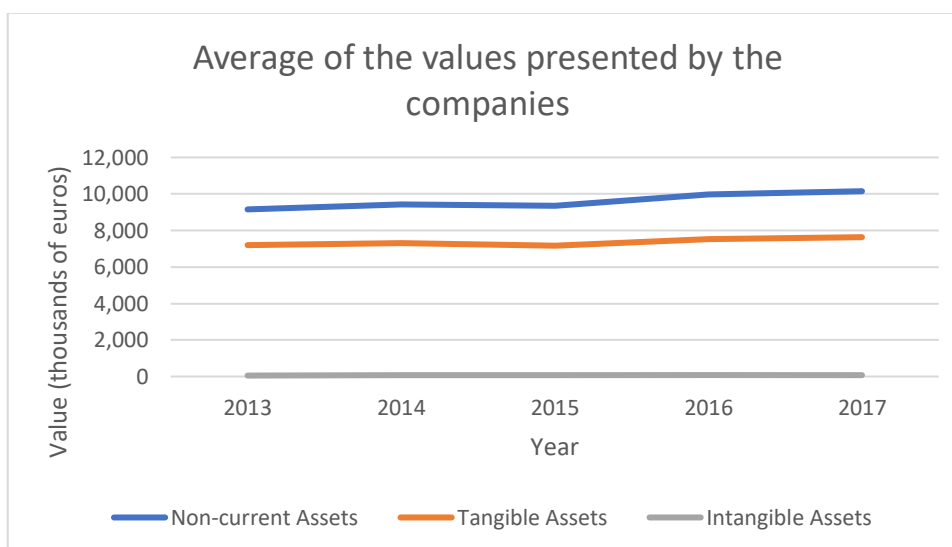

Posteriorly, the analysis of the average ratio by district was calculated to each one of the studied ratios: Financial autonomy; Fixed assets coverage; Investment coverage and solvency, as it presents in graphic 3.

- Concerning financial autonomy ratio, in the analysed years, it presents a very dissimilar

evolution: In 2013, with 50.1, 22.3 in 2014, 24.1 in 2015, 2016 with 30.8 and, in 2017, 45.9.

- In terms of fixed assets coverage ratio, and as the previous ratio, it had an inconstant variation: 22.2, in 2013; 12.8, in 2014; 21.6, in 2015; 29.6, in 2016; 4.6, in the last year of the analysis.

- When it comes to investment coverage ratio, in general, it had a positive evolution, presenting the following values: In 2013, 6.3; in 2014, 14.5; in 2015, 13.4; in 2016, 19.7 and, in 2017, 29.2.

- Lastly, the solvency ratio, which had a constant increase, expressed by the subsequent numbers: In 2013, 1.4; In 2014, 1.5; In 2015, 1.6; In 2016, 1.7; In 2017, 1.7.

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Graphic 3 – Average ratios by districts
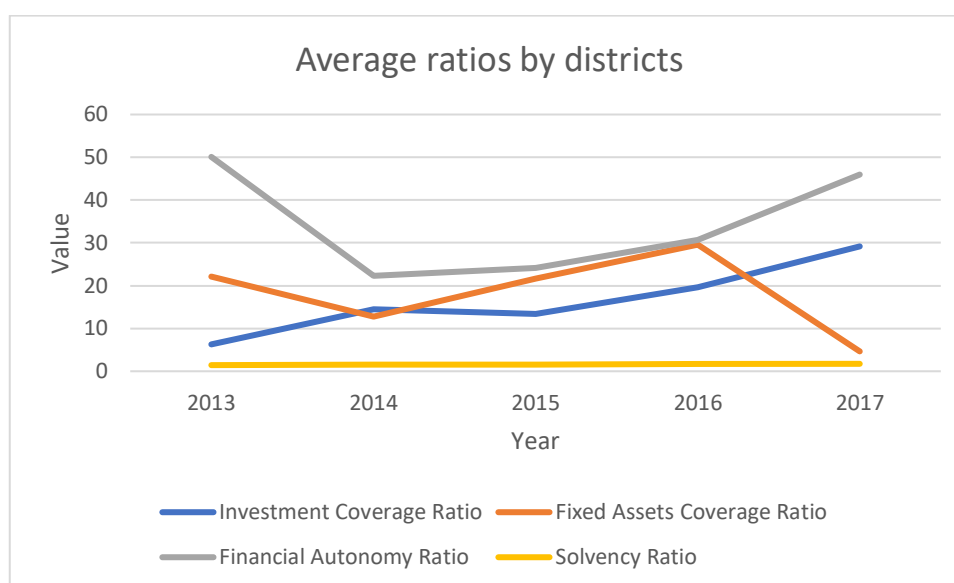
It is important to mention that the average of hotel ratios by district include very significant *outliers* and, because of that, some of the presented values are skewed, less reliable and more difficult to interpret. Indeed, the fact that standard deviation surpasses the average values translates a considerable dispersion of data, so those *outliers* will not be considered in subsequent studies.

To assess the level of association, and such intensity, among variables, non-parametric measures were used. In this case, to Spearman´s Rho. Considering that some ratios and indicators use the same variables, we could deduce as obvious the association between the behaviour of some values and the behaviour of some ratios and indicators. Spearman´s correlation coefficient, or Spearman´s Rho, varies between -1 and 1. The nearest to these extremes, the bigger it is the association between variables. The positive signal of the correlation means that the variables vary in the same sense and vice versa (Pestana & Gageiro, 2005). In order to validate the significance of such associations, the significance values should be less than or equal to 0.05.

Is should be highlighted that there is a significant positive association between the variable Equity and the Investment Coverage Ratio, Equity and Autonomy Ratio, Equity and Solvency Ratio during the analysed period (2013-2017).

Investment Coverage Ratio has a significant positive association with Autonomy Ratio and Solvency Ratio in the analysed period (2013-2017). In 2016, Investment Coverage Ratio also has a significant positive association with Fixed Assets Coverage Ratio.

Fixed Assets Coverage Ratio has a significant positive association with Investment Coverage Ratio and Solvency Ratio, in 2016.

Autonomy Ratio has also a significant positive association with Investment Coverage Ratio and Solvency Ratio during the period.

Solvency Ratio has a significant positive association with Investment Coverage Ratio and Autonomy Ratio in the period between 2013 and 2017.

When it comes to significant negative association, we can highlight Non-current Liabilities with Autonomy Ratio in the period.

Tangible Assets has a significant negative association with Fixed Assets coverage ratio in the year of 2013.

Table 2 – Results of Spearman´s Rho Parametric Test to verify the relation between variables

Spearman´s Rho	2017	Investment Coverage Ratio	Fixed Assets Coverage Ratio	Autonomy Ratio	Solvency Ratio
Equity	Correlation coefficient	0,429	0,072	0,467	0,496
	Sig. (2-tailed)	0,000	0,067	0,000	0,000
Liability	Correlation coefficient	-0,205	-0,133	-0,213	-0,240
	Sig. (2-tailed)	0,000	0,001	0,000	0,000
Non-current Liabilities	Correlation coefficient	-0,266	-0,043	-0,404	-0,285
	Sig. (2-tailed)	0,000	0,271	0,000	0,000
Non-current Assets	Correlation coefficient	-0,045	-0,138	0,037	0,051
	Sig. (2-tailed)	0,249	0,000	0,345	0,191
Fixed Assets	Correlation coefficient	-0,169	-0,163	-0,007	0,008
	Sig. (2-tailed)	0,000	0,000	0,865	0,837
Intangible Assets	Correlation coefficient	-0,004	0,044	0,032	-0,013
	Sig. (2-tailed)	0,913	0,262	0,410	0,741
Investment Coverage Ratio	Correlation coefficient	1,000	0,393	0,808	0,844
	Sig. (2-tailed)		0,000	0,000	0,000
Fixed Assets Coverage Ratio	Correlation coefficient	0,393	1,000	0,169	0,258
	Sig. (2-tailed)	0,000		0,000	0,000
Autonomy Ratio	Correlation coefficient	0,808	0,169	1,000	0,902
	Sig. (2-tailed)	0.000	0,000		0,000
Solvency Ratio	Correlation coefficient	0,844	0,258	0,902	1,000
	Sig. (2-tailed)	0,000	0,000	0,000	
Spearman´s Rho	**2016**	**Investment Coverage Ratio**	**Fixed Assets Coverage Ratio**	**Autonomy Ratio**	**Solvency Ratio**
Equity	Correlation coefficient	0,471	0,058	0,512	0,532
	Sig. (2-tailed)	0,000	0,134	0,000	0,000
Liability	Correlation coefficient	-0,195	-0,125	-0,198	-0,230
	Sig. (2-tailed)	0,000	0,001	0,000	0,000
Non-current Liabilities	Correlation coefficient	-0,264	-0,054	-0,377	-0,279
	Sig. (2-tailed)	0,000	0,164	0,000	0,000
Non-current Assets	Correlation coefficient	-0,015	-0,141	0,062	0,068
	Sig. (2-tailed)	0,693	0,000	0,112	0,084
Tangible Assets	Correlation coefficient	-0,134	-0,288	0,018	0,029
	Sig. (2-tailed)	0,001	0,000	0,641	0,465
Intangible Assets	Correlation coefficient	0,025	0,039	0,033	0,021
	Sig. (2-tailed)	0,522	0,318	0,392	0,599
Investment Coverage Ratio	Correlation coefficient	1,000	0,514	0,825	0,862
	Sig. (2-tailed)		0,000	0,000	0,000
Fixed Assets Coverage Ratio	Correlation coefficient	0,514	1,000	0,166	0,267
	Sig. (2-tailed)	0,000		0,000	0,000
Autonomy Ratio	Correlation coefficient	0,825	0,166	1,000	0,911
	Sig. (2-tailed)	0.000	0,000		0,000
Solvency Ratio	Correlation coefficient	0,862	0,267	0,911	1,000
	Sig. (2-tailed)	0,000	0,000	0,000	
Spearman´s Rho	**2015**	**Investment Coverage Ratio**	**Fixed Assets Coverage Ratio**	**Autonomy Ratio**	**Solvency Ratio**
Equity	Correlation coefficient	0,517	0,060	0,549	0,568
	Sig. (2-tailed)	0,000	0,127	0,000	0,000
Liability	Correlation coefficient	-0,190	-0,149	-0,2	-0,223
	Sig. (2-tailed)	0,000	0,000	0,000	0,000
Non-current Liabilities	Correlation coefficient	-0,245	-0,056	-0,344	-0,265
	Sig. (2-tailed)	0,000	0,152	0,000	0,000
Non-current Assets	Correlation coefficient	0,005	-0,152	0,072	0,077
	Sig. (2-tailed)	0,890	0,000	0,065	0,049
Tangible Assets	Correlation coefficient	-0,115	-0,288	0,027	0,035
	Sig. (2-tailed)	0,003	0,000	0,484	0,373
Intangible Assets	Correlation coefficient	0,032	0,052	0,046	0,058
	Sig. (2-tailed)	0,418	0,180	0,237	0,139
Investment Coverage Ratio	Correlation coefficient	1,000	0,472	0,850	0,884
	Sig. (2-tailed)		0,000	0,000	0,000
Fixed Assets Coverage Ratio	Correlation coefficient	0,472	1,000	0,160	0,270
	Sig. (2-tailed)	0,000		0,000	0,000

		Investment Coverage Ratio	Fixed Assets Coverage Ratio	Autonomy Ratio	Solvency Ratio
Autonomy Ratio	Correlation coefficient Sig. (2-tailed)	0,850 0,000	0,160 0,000	1,000	0,931 0,000
Solvency Ratio	Correlation coefficient Sig. (2-tailed)	0,884 0,000	0,270 0,000	0,931 0,000	1,000
Spearman´s Rho	**2014**	**Investment Coverage Ratio**	**Fixed Assets Coverage Ratio**	**Autonomy Ratio**	**Solvency Ratio**
Equity	Correlation coefficient Sig. (2-tailed)	0,587 0,000	0,093 0,018	0,617 0,000	0,638 0,000
Liability	Correlation coefficient Sig. (2-tailed)	-0,161 0,000	-0,141 0,000	-0,167 0,000	-0,185 0,000
Non-current Liabilities	Correlation coefficient Sig. (2-tailed)	-0,219 0,000	-0,04 0,301	-0,319 0,000	-0,229 0,000
Non-current Assets	Correlation coefficient Sig. (2-tailed)	0,34 0,381	-0,141 0,000	0,103 0,008	0,107 0,006
Tangible Assets	Correlation coefficient Sig. (2-tailed)	-0,083 0,033	-0,283 0,000	0,049 0,207	0,061 0,116
Intangible Assets	Correlation coefficient Sig. (2-tailed)	0,021 0,593	0,008 0,832	0,037 0,342	0,049 0,208
Investment Coverage Ratio	Correlation coefficient Sig. (2-tailed)	1,000	0,475 0,000	0,869 0,000	0,902 0,000
Fixed Assets Coverage Ratio	Correlation coefficient Sig. (2-tailed)	0,475 0,000	1,000	0,185 0,000	0,286 0,000
Autonomy Ratio	Correlation coefficient Sig. (2-tailed)	0,869 0,000	0,185 0,000	1,000	0,934 0,000
Solvency Ratio	Correlation coefficient Sig. (2-tailed)	0,902 0,000	0,286 0,000	0,934 0,000	1,000
Spearman´s Rho	**2013**	**Investment Coverage Ratio**	**Fixed Assets Coverage Ratio**	**Autonomy Ratio**	**Solvency Ratio**
Equity	Correlation coefficient Sig. (2-tailed)	0,584 0,000	0,096 0,014	0,637 0,000	0,65 0,000
Liability	Correlation coefficient Sig. (2-tailed)	-0,159 0,000	-0,161 0,000	-0,143 0,000	-0,171 0,000
Non-current Liabilities	Correlation coefficient Sig. (2-tailed)	-0,216 0,000	-0,067 0,086	-0,292 0,000	-0,219 0,000
Non-current Assets	Correlation coefficient Sig. (2-tailed)	0,027 0,49	-0,162 0,000	0,118 0,000	0,113 0,004
Tangible Assets	Correlation coefficient Sig. (2-tailed)	-0,083 0,033	-0,294 0,000	0,073 0,062	0,075 0,055
Intangible Assets	Correlation coefficient Sig. (2-tailed)	-0,023 0,550	-0,005 0,894	0,007 0,854	-0,003 0,929
Investment Coverage Ratio	Correlation coefficient Sig. (2-tailed)	1,000	0,456 0,000	0,869 0,000	0,895 0,000
Fixed Assets Coverage Ratio	Correlation coefficient Sig. (2-tailed)	0,456 0,000	1,000	0,178 0,000	0,263 0,000
Autonomy Ratio	Correlation coefficient Sig. (2-tailed)	0,869 0,000	0,178 0,000	1,000	0,942 0,000
Solvency Ratio	Correlation coefficient Sig. (2-tailed)	0,895 0,000	0,263 0,000	0,942 0,000	1,000

On the next step, Kruskal-Wallis test was conducted. It is a non-parametric test applied to variables of order, at least, nominal, and it is, also, an alternative to One-Way Anova used in a normal distribution (Pestana & Gageiro, 2005).

This measure allows the districts median comparison in order to know if the multiple ratios have equal distribution in them. In the case statistical significance is higher than 0.05, then the Ratio is equal among districts, which means the hypothesis is confirmed. In the opposite way, if statistical significance is less than 0.05, then the Ratio is different among districts, which means the hypothesis is rejected.

In terms of results, the distribution of the Investment Coverage Ratio is equal among the Portuguese districts in the years of 2013 and 2014. In the years of 2015 to 2017, the Investment Coverage Ratio is not equal among the same districts.

The distribution of the Fixed Assets Coverage Ratio, on the other hand, is equal between 2013 and 2016, across the districts, but is not equal in the year of 2017.

By its turn, the distribution of the financial autonomy ratio is equal in 2013, 2015 and 2017, however, it differs in 2014 and 2016.

The distribution of the solvency ratios is egalitarian during all the analysed years, across the different Portuguese districts.

Table 3 – Results of Non-parametric Kruskal-Wallis test to verify if districts median present equal distribution

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Cob.INV 2017 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,033	Reject null hypothesis.
2	The distribution of Cob.INV 2016 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,036	Reject null hypothesis.
3	The distribution of Cob.INV 2015 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,035	Reject null hypothesis.
4	The distribution of Cob.INV 2014 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,066	**Retain null hypothesis.**
5	The distribution of Cob.INV 2013 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,145	**Retain null hypothesis.**
6	The distribution of Cob.AF 2017 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,005	Reject null hypothesis.
7	The distribution of Cob.AF 2016 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,197	**Retain null hypothesis.**
8	The distribution of Cob.AF 2015 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,597	**Retain null hypothesis.**
9	The distribution of Cob.AF 2014 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,195	**Retain null hypothesis.**
10	The distribution of Cob.AF 2013 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,819	**Retain null hypothesis.**
11	The distribution of Aut.FIN 2017 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,058	**Retain null hypothesis.**
12	The distribution of Aut.FIN 2016 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,048	Reject null hypothesis.
13	The distribution of Aut.FIN 2015 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,102	**Retain null hypothesis.**
14	The distribution of Aut.FIN 2014 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,048	Reject null hypothesis.
15	The distribution of Aut.FIN 2013 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,085	**Retain null hypothesis.**
16	The distribution of Solvab 2017 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,074	**Retain null hypothesis.**
17	The distribution of Solvab 2016 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,091	**Retain null hypothesis.**
18	The distribution of Solvab 2015 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,231	**Retain null hypothesis.**
19	The distribution of Solvab 2014 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,097	**Retain null hypothesis.**
20	The distribution of Solvab 2013 is equal in Districts categories.	Independent Samples of Kruskal-Wallis Test	,130	**Retain null hypothesis.**
	Asymptotic significances are exhibited. Significance level is 0,05.			

Concerning ratios median across districts, it allows us to identify districts with bigger or smaller median, by ratio. Through the analysis of the district's median investment coverage ratio (table 4), it was possible to highlight the following districts: On one side, Horta, in the Azores Autonomous Region, as the district with the biggest median investment coverage ratio in the analysed period. On the other side, Bragança, as the district with the smallest median investment coverage ratio in Portugal in the course of the analysed period.

Table 4 – Investment Coverage Ratio median by districts, between 2013 and 2017

Investment Coverage Ratio median	2017	2016	2015	2014	2013
Angra do Heroísmo	0,5428	0,5470	0,7624	0,7353	0,6976
Aveiro	0,5122	0,4748	0,4372	0,3391	0,3856
Beja	0,5293	0,5509	0,4656	0,3713	0,3672
Braga	0,5894	0,4454	0,4545	0,3707	0,3625
Bragança	0,0799	0,0469	0,02	0,0263	0,0322
Castelo Branco	0,6062	0,7412	0,6701	0,5546	0,5453
Coimbra	0,3998	0,4321	0,3477	0,3287	0,3287
Évora	0,4728	0,4528	0,4373	0,3259	0,3707
Faro	0,5780	0,5486	0,5187	0,4768	0,4513
Funchal	0,5635	0,5450	0,5505	0,5872	0,5529
Guarda	0,3941	0,3964	0,3830	0,1753	0,2013

Horta	1,2510	1,2014	1,2102	1,1294	0,8769
Leiria	0,3880	0,4014	0,2992	0,2978	0,2155
Lisboa	0,6889	0,6119	0,56	0,5024	0,4659
Ponta Delgada	0,5658	0,5615	0,5022	0,5070	0,5070
Portalegre	0,4488	0,3215	0,3015	0,2463	0,2464
Porto	0,6378	0,5831	0,5757	0,4730	0,4147
Santarém	0,4742	0,4277	0,3888	0,3340	0,3414
Setúbal	0,5210	0,3518	0,4841	0,4351	0,4343
Viana do Castelo	0,5230	0,4279	0,4156	0,4292	0,4124
Vila Real	0,4404	0,4408	0,1509	0,2036	0,2486
Viseu	0,5375	0,4557	0,3334	0,2297	0,2389

Concerning median fixed assets coverage ratio, we can state some conclusions, as exposed in table 5: In one hand, the districts of Angra do Heroísmo, Bragança, Horta e Porto present the biggest median fixed assets coverage ratio in Portugal. On the other hand, the district of Santarém presents the lowest median fixed assets coverage ratio.

Table 5 – Fixed Assets Coverage Ratio median by districts, between 2013 and 2017

Fixed Assets Coverage Ratio median	2017	2016	2015	2014	2013
Angra do Heroísmo	1,8331	1,8182	2,3630	1,6447	0,9722
Aveiro	1,0984	1,1257	1,1159	1,0191	1,0742
Beja	1,0127	1,0048	1,1121	1,1408	1,2197
Braga	0,9591	1,1035	1,0670	1,1064	0,9968
Bragança	1,2071	1,6739	1,2094	1,0819	1,0252
Castelo Branco	1,1134	0,9899	0,9820	0,9716	1,0182
Coimbra	1,1814	1,0280	1,0156	1,0563	1,0697
Évora	0,8917	1,0082	1,0038	1,0317	1,0330
Faro	1,0653	1,0615	1,0924	1,0953	1,0861
Funchal	0,8969	1,0229	1,0260	1,0358	1,0467
Guarda	0,8890	1,0019	0,9765	1,0357	1,0310
Horta	1,2169	1,6520	1,7175	1,5280	1,3540
Leiria	0,8952	1,1226	1,0260	1,0019	1,0228
Lisboa	1,0793	1,1408	1,0619	1,0594	1,0358
Ponta Delgada	0,8914	1,0150	1,0292	1,0174	1,0107
Portalegre	1,1958	1,2159	1,1668	1,1207	1,0091
Porto	1,3777	1,1378	1,1085	1,0888	1,0750
Santarém	0,9351	0,9932	0,9264	1,0111	1,0009
Setúbal	0,8683	1,0186	0,9913	0,9814	0,9692
Viana do Castelo	0,9071	1,1087	1,0776	1,0669	1,0689
Vila Real	1,2	1,0849	1,1083	1,1001	1,0369
Viseu	1,0358	1,0621	1,0628	1,0751	1,0565

Regarding median Financial Autonomy Ratio and Solvency Ratio, none of the districts has a clear prominent position, as it can be stated through the table 6 and 7, respectively.

Table 6 – Financial Autonomy Ratio median by districts, between 2013 and 2017

Financial Autonomy Ratio median	2017	2016	2015	2014	2013
Angra do Heroísmo	0,8643	0,7654	1,9337	1,7470	1,6506
Aveiro	1,0603	1,0799	0,6744	0,7848	0,6085
Beja	0,7540	0,6946	0,4961	0,5182	0,5122
Braga	1,2221	1,0599	0,7306	0,5902	0,5928
Bragança	0,0786	0,0355	0,0176	0,063	0,0375
Castelo Branco	0,9222	1,6226	1,5285	1,4888	0,5924
Coimbra	0,7193	1,122	0,5415	0,4903	0,668
Évora	1,2922	0,9433	0,8301	0,6279	0,5607
Faro	1,1308	1,0119	0,9025	0,8534	0,746
Funchal	1,6544	1,3238	1,2425	1,2403	1,2038
Guarda	0,8355	0,9391	0,6196	0,3580	0,3595
Horta	4,1747	4,1305	4,5516	6,45	4,0033
Leiria	0,8988	0,8821	0,5997	0,3676	0,3422

Lisboa	1,4822	1,1422	1,0538	0,7525	0,6724
Ponta Delgada	1,21	1,2982	1,1823	1,0309	1,4343
Portalegre	0,9535	0,4777	0,7898	0,3572	1,1789
Porto	1,2932	1,3739	1,3148	0,7887	0,7587
Santarém	0,9463	0,9085	0,8873	0,6279	0,6254
Setúbal	0,7464	0,4173	0,6739	0,5210	0,5177
Viana do Castelo	0,6941	0,7208	0,6012	0,5881	0,5320
Vila Real	0,7491	1,07	0,2002	0,2448	0,3126
Viseu	0,7956	0,4382	0,3801	0,3011	0,3322

Table 7 - Solvency Ratio median by districts, between 2013 and 2017

Solvency Ratio median	2017	2016	2015	2014	2013
Angra do Heroísmo	0,5491	0,7139	1,2728	1,4813	1,1136
Aveiro	0,7738	0,7453	0,4029	0,3670	0,3437
Beja	0,6244	0,4433	0,4545	0,4647	0,3582
Braga	0,6895	0,6521	0,5209	0,4004	0,4059
Bragança	0,077	0,035	0,0175	0,0251	0,0319
Castelo Branco	0,7377	0,9572	0,7065	0,5253	0,3876
Coimbra	0,6466	0,7478	0,3938	0,2964	0,3542
Évora	0,7559	0,7408	0,6544	0,4341	0,4604
Faro	0,6731	0,5914	0,6530	0,6455	0,5445
Funchal	0,8779	0,6105	0,6695	0,7522	0,7577
Guarda	0,5994	0,6025	0,5803	0,1936	0,2291
Horta	1,9999	2,3213	2,4402	3,3224	2,348
Leiria	0,4971	0,4019	0,2977	0,2705	0,2465
Lisboa	0,8613	0,76	0,6740	0,4997	0,4017
Ponta Delgada	0,7666	0,7047	0,6540	0,6779	0,6597
Portalegre	0,6174	0,3324	0,3283	0,3148	0,3189
Porto	0,8698	0,7138	0,5648	0,487	0,4760
Santarém	0,5787	0,4727	0,4645	0,4122	0,4532
Setúbal	0,6058	0,3046	0,4778	0,3662	0,276
Viana do Castelo	0,5836	0,6048	0,5280	0,5382	0,532
Vila Real	0,6578	0,7179	0,1744	0,2326	0,2957
Viseu	0,5132	0,3316	0,3455	0,2772	0,2909

It assumes great importance the analysis of the ratios comparing hotels with and without restaurant, according to the respective activity code (CAE). Mann–Whitney U test allows the comparison between 2 distinct groups (in this case, CAE 51111 and CAE 51121) in order to know if multiple ratios have equal distribution in those.

If significance is higher than 0.05, then the ratio is equal between companies with different activity codes, so the hypothesis is confirmed. If significance is less than 0.05, then the ratio is different between companies with different activity codes, so the hypothesis is rejected.

From the 20 tested hypotheses, only 5 confirm the hypothesis, which are: Financial Autonomy Ratio in 2013 and 2015; Solvency Ratio in 2013, 2014 and 2015.

Table 8 – Result of Mann–Whitney U test between 2013 and 2017

	Null hypothesis	Test	Sig.	Decision
1	The distribution of Cob.INV 2017 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,000	Reject null hyphotesis.
2	The distribution of Cob.INV 2016 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,000	Reject null hyphotesis.
3	The distribution of Cob.INV 2015 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,016	Reject null hyphotesis.
4	The distribution of Cob.INV 2014 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,014	Reject null hyphotesis.
5	The distribution of Cob.INV 2013 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,015	Reject null hyphotesis.
6	The distribution of Cob.AF 2017 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,000	Reject null hyphotesis.
7	The distribution of Cob.AF 2016 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,001	Reject null hyphotesis.

8	The distribution of Cob.AF 2015 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,012	Reject null hyphotesis.
9	The distribution of Cob.AF 2014 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,002	Reject null hyphotesis.
10	The distribution of Cob.AF 2013 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,004	Reject null hyphotesis.
11	The distribution of Aut.FIN 2017 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,039	Reject null hyphotesis.
12	The distribution of Aut.FIN 2016 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,005	Reject null hyphotesis.
13	The distribution of Aut.FIN 2015 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,101	**Retain null hypothesis**.
14	The distribution of Aut.FIN 2014 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,045	Reject null hyphotesis.
15	The distribution of Aut.FIN 2013 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,215	**Retain null hypothesis**.
16	The distribution of Solvab 2017 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,006	Reject null hyphotesis.
17	The distribution of Solvab 2016 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,007	Reject null hyphotesis.
18	The distribution of Solvab 2015 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,088	**Retain null hypothesis**.
19	The distribution of Solvab 2014 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,058	**Retain null hypothesis**.
20	The distribution of Solvab 2013 is equal in the categories of CAE Rev.3 Principal.	Independent samples of Mann–Whitney U test	,067	**Retain null hypothesis**.

Asymptotic significances are exhibited. Significance level is ,050.

Lastly, median ratios by activity code (CAE) were analysed.

In all the Financial Structure Ratios analysed, companies with CAE "55121-Hotels without restaurant" the median ratios are superior to those of companies with CAE "55111-Hotels with restaurant" as can be observed in table 9.

Table 9 – Median ratios by CAE

Investment Coverage Ratio median	2017	2016	2015	2014	2013
55111	0,5512	0,5039	0,4552	0,4160	0,3744
55121	0,8094	0,6902	0,6198	0,5713	0,5702
Fixed Assets Coverage Ratio median	2017	2016	2015	2014	2013
55111	0,9959	1,0777	1,0403	1,0358	1,0288
55121	1,4554	1,2523	1,2056	1,2215	1,1846
Financial Autonomy Ratio median	2017	2016	2015	2014	2013
55111	1,0748	0,9826	0,8319	0,7303	0,6671
55121	1,6150	1,8237	1,3148	1,0723	0,7233
Solvency Ratio median	2017	2016	2015	2014	2013
55111	0,6762	0,6140	0,5391	0,4564	0,3966
55121	0,8281	0,8783	0,7196	0,5876	0,5969

Conclusions

In terms of final considerations, we can mention that:

The most hotel companies are located in the traditionally well-known tourism districts. There are more hotels with restaurant over hotels without restaurant in each district, except in Angra do Heroísmo.

In terms of average by district, Investment Coverage Ratio, as well as Solvency Ratio had a positive evolution in the course of the analysed years, being higher than 1, which means, on one hand, that Equity covers the applications in Tangible and Intangible Assets and, on the other, that Liabilities liquidation ability exists, resorting, only, to Equity, which means that Portuguese hotel companies are solvent, i. e., have the capacity to fulfil their contracted obligations.

Concerning Financial Autonomy Ratio and Fixed Assets Coverage Ratio, they present, in terms of district average, inconstant values, between 2013 and 2017, not allowing conclusions to be drawn.

However, in terms of median values, both Investment Coverage Ratio and Solvency Ratio indicate that Portuguese hotel companies Equity are not able to cover applications in Tangible and Intangible Assets and that they are not solvent, as they present values lower than 1 during the analysed years, despite of its growing tendency in the analysed period.

When the distribution of ratios is analysed between hotels with and without restaurant the differences are evident. Only in five comparisons the both groups have got the same distribution. Concerning all the analysed ratios, hotels with restaurant present median values lower than hotels without restaurant. Then, hotels with restaurant present a lower level of creditworthy than hotels without restaurant.

Overall, the ratios analysed have a similar distribution across all districts. In other words, we can state that the level of coverage, autonomy and solvency is similar, and there is no more attractive district than the other, in terms of creditworthy. Therefore, it is noteworthy that exceptionally the investment coverage ratio has significant different behaviour among districts in the last three years. The district of Horta is highlighted with a median value greater than 1 and Bragança with only 0.07. The hotels in Horta, Lisboa e Castelo Branco the level of creditworthy is superior.

It is important to highlight that average ratios by district include *outliers*, which means that some values are skewed and have less reliability. The fact that standard deviation is considerably superior to average means a large dispersion of data, so those *outliers* should be eliminated in subsequent studies.

Acknowledgements

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