Comparison of Financial Performance between Branded and Non-branded Hotel Companies using Composite Indicator

Catarina Antónia MARTINS

Instituto Politécnico de Bragança

Campus do Cruzeiro - Avenida 25 de Abril, Cruzeiro, Lote 2 -Apartado 128

5370-202 Mirandela/Portugal

Tel: 00.351.273.309.937

E-mail: catarina@ipb.pt

Clara B. VAZ

Instituto Politécnico de Bragança/CeDRI/CEGI/INESC TEC

Campus de Santa Apolónia – 5300-253 Bragança/Portugal

Tel: 00.351.273.303.112;

E-mail: clvaz@ipb.pt

Jorge Manuel Afonso ALVES (*)

Instituto Politécnico de Bragança/UNIAG/OBEGEF

Campus de Santa Apolónia – 5300-253 Bragança/Portugal

Tel: 00.351.273.303.121; Fax: 00.351.273.313.051

E-mail: jorge@ipb.pt

(*) Contact Author.

Abstract

The Hospitality industry is one of the main sectors of tourism activity, being important to assess the performance of the hotel companies. The aim of the present paper is to study the financial performance of 570 companies operating hotel units in Portugal, in 2017, allowing for comparison among companies with similar stars rating and market orientation to explore the question of branded and non-branded affiliation. This issue is studied using a methodology based on Data Envelopment Analysis to assess the overall performance for each company. The hotel company performance is assessed through the aggregation of multiple financial indicators using the composite indicator derived from the DEA model. The empirical results show that the hotel branded companies have, on average, significantly, higher overall financial performance than hotel non-branded companies. Although, the best practices are observed in hotel branded and non-branded companies. This analysis can support the strategic decision process of the hotel companies in choosing to operate independently or selecting a brand affiliation.

Keywords: Hotel companies, Financial performance, Branded and non-branded affiliation, Data Envelopment Analysis.

1- Introduction

Tourism activity in Portugal is one of the most promising economic activities. According to the National Tourism Authority (Turismo de Portugal, 2019), in 2017, Portugal reported 20,6 million guests in accommodation establishments. There are 1.993 hotels and similar accommodation (hotels, tourist apartments, tourist villages, aparthotels, rural hotels, and upscale historic and heritage hotel units named Pousadas) that for the purpose of this work will be referred as hotel units managed by hotel companies. Furthermore, in Portugal 60% of the total number of hotels and similar accommodation are non-branded units and the remaining 40% are branded units (Deloitte, 2018).

This context explains why hospitality industry is one of the main sectors of tourism activity, being important to understand performance of hospitality firms, i.e, hotel industry. Since it is labor intensive, hotel industry relies on the study of management performance to act accordingly and to be able to adopt strategic (Atkinson & Brown, 2001) measures to improve financial performance.

There are ample contributions in literature dealing with performance measurement in hotels. Pnevmatikoudi & Stavrinoudis (2016) present a classification of the hotel performance measurement indicators presented in international scientific research providing an overview of the performance measures indicators used by researchers and their classification. The authors conclude that the hotel performance is a complex and multidimensional concept. Therefore, authors conclude that scientific research has not yet set well defined and useful measures and indicators are required to allow a scientific, still practical, measurement of the hotel companies performance. Most recently, Alvarez-Ferrer, Campa-Planas & Gonzales-Bustos (2018) based on literature review identify the key factors for the success in the hotel sector grouped in three categories: financial (indebtedness; size in terms of assets, sales, employees; margin and asset turnover; operating leverage); management (management system, in terms of property; quality management system; environmental management system, corporate social responsibility, yield management) and generic (longevity, location and position).

There are some studies that address hotels performance for the Portuguese case using Data Envelopment Analysis (DEA) methodology (Neves & Lourenço, 2009) but our focus is to study the performance of hotel companies on the particular subject of branded versus non-branded operation. Specifically, each company is established in Portugal and may operate one or more hotel units. The present paper focuses on the financial performance assessment of Portuguese hotel companies based on financial indicators derived from their financial statements published in 2017. The financial performance for each company is measured through the aggregation of multiple financial indicators using the Composite Indicator (CI) calculated from the DEA model.

The main contributions of this study are: (i) the large dataset used which includes 570 hotel companies observed in 2017; (ii) the use of the DEA model to aggregate sub-indicators to derive the CI, in the hotel industry. Taking into account the large heterogeneity of the assessed hotel companies given by stars

rating, services available and market orientation, the initial sample is grouped in four segments to assure the homogeneity required by the DEA methodology. Each segment only includes the hotel companies owning similar stars rating, i.e., Lower Stars (LS) or Upper Stars (US), and market orientation, Business or Leisure. For the scope of the present study, a more business oriented company is a company with hotel units having meeting rooms or conference seats as facilities while more leisure oriented companies do not have these facilities. The brand effect on financial performance of hotel companies in each segment is explored through the overall performance, allowing to compare the performance between branded and non-branded hotel companies.

The remainder of the paper is as follows. Next section presents a literature review on performance measurement in hotels focusing on branded versus independent hotel operation. Then, second section describes the methodology adopted. Third section describes the data and variables and fourth section discusses the results. Finally, last section ends with the most important conclusions and suggestions for further research.

2- Literature review

A major topic being studied concerning hotel performance is the type of the hotel operation namely the question regarding brand affiliation versus independent operation. A hotel throughout its life needs to revise its strategy several times in order to revitalize the interest of its customers by improving its image and reputation and ensuring its profitability. Historically, independent hotels used representatives or formed promotional consortia to promote them in international markets. However, the existence of a large number of brands has made it increasingly difficult to develop integrated and effective marketing strategies even in the case of consortia creation. Therefore, the branding for the promotion of elected markets has emerged as an essential condition of success and many internationally acting hotels choose a common brand under which they are promoted. Often, hotels tend to integrate into chains that allow them to use vocational training programs and common staff selection techniques, universal reservation systems and international marketing. Entering international markets requires investments that an individual hotel cannot afford. The advantages of this initiative stem from easy customer recognition, identity creation, brand control and service homogeneity. All hotels using the same brand are required to comply with certain rules regarding the services they provide and are subject to permanent control by the organization managing or supervising the common brand. Besides the payment of fees, the disadvantages became from hotel standardization since it eliminates diversification and, on the other, extends to all hotels of the same brand the bad image caused by poor service in one of them (Cunha, 2019).

There is some body of literature around the dichotomy of non-branded (independent; privately owned) and branded (chain and franchise) hotels under several topics of research: performance measurement (Carvell, Canina, & Sturman, 2016; Manasakis, Apostolakis, & Datseris, 2013; O'Neill & Carlbäck, 2011), affiliation decision (Carlbäck, 2012; Holverson & Revaz, 2006; Ivanova & Ivanov, 2015), hotel profitability and revenues (Devesa & Peñalver, 2013; T. J. Langlois, 2003; Sami & Mohamed, 2014) managers performance (Martin, 2017), innovation performance or adoption (Ottenbacher, Shaw, & Lockwood, 2006) and strategy for globalization (Niewiadomski, 2014; O'Neill, Dev, & Hiromi, 2013).

By analyzing longitudinal data of more than 51.000 hotels operating in the United States, O'Neill and Carlbäck (2011) draw conclusions regarding the performance of branded hotels compared to the independent operations under various economic conditions. The authors point out several contributions in literature concerning independent or privately owned business comparing advantages from hotel affiliation and independently managed hotels. The conclusions of the study arise from studying widely accepted proxies for performance in the hotel industry, i.e., occupancy levels, Average Daily Rates (ADR), Revenues per Available Room (RevPAR) and Net Operating Income (NOI) in hotels for the two type of operation, branded or non-branded. Likewise, Yang and Mao (2017) study the dichotomy of independent and branded hotels yet in this case the authors address the performance changes of independent hotels due to the presence of nearby branded hotels in Texas, highlighting the importance of comparing and also learning with the different types of operation.

The affiliation decision of an independent hotel to a brand is studied by Ivanova & Ivanov (2015) from the perspective of the owners and managers of individual hotels in Bulgaria. The study has some relevant

conclusions about what are the main accommodation establishments' characteristics shaping hotel managers' perceptions, whereas Bulgarian hoteliers are looking for popular hotel brands with positive image. Carvell, Canina and Sturman (2016) address performance comparison between brand-affiliated and unaffiliated hotel properties revealing some mixed results. The study is focused on the consumer's response to brand advantages in the various market segments and market types. The authors review some of the most recent studies on this topic and refer to the broad spectrum of opinions and conflicting findings that requires a more comprehensive study of the performance of branded hotels in comparison with non-branded hotels. The study concludes about performance differentials since there are no consistent advantages in all segments for either the affiliated hotels or the unaffiliated properties, taking into account comparison factors: local competitive conditions and hotel characteristics.

The relationship between branding, room revenue and volatility is analyzed by Langlois (2003) trying to conclude if affiliated hotels are less volatile, concerning room revenues, than independent hotels. The study analyzed hotel units with more than 100 rooms in nine regions of the United States. Among others, an important conclusion of the study is that chain affiliated hotels have historically been less volatile than independent hotels due primarily to a lower volatility in room rate, however, the data suggests that for a period following 11th September, independent hotels were actually less volatile than chain hotels.

According to Assaf and Josiassen (2016) traditional approaches to performance measurement involve accounting based indicators, cost volume profit analysis, the balanced scorecard and the importance-performance analysis method. However, the authors refer the advantages of frontier methods to assess the impact of operational strategies and policies on tourism performance instead of using traditional approaches. In fact contributions in literature point to the use of DEA as one of the most powerful method of performance evaluation for hotel efficiency (Chiang, 2006; Chiang, Tsai, & Wang, 2004; Wu, Tsai, & Zhou, 2011). Although, DEA results can be used as to support the strategic decision process or performance management, Neves and Lourenço (2009) conclude from literature review that the vast majority of the studies have used the DEA to analyze the hospitality industry performance and none of them uses the DEA results to derive strategic implications.

DEA methodology has been extensively used to assess the hotels performance. Rebelo, Matias and Carrasco (2013) conclude that previous studies are limited to one country and usually the main purpose of the studies is to benchmark best practices studying hotels efficiency. The authors point out the exemption of the works of Pulina, Detotto, and Paba (2010) and Huang, Mesak, Hsu, and Qu (2012) which are based on a regional analysis. From Rebelo et al. (2013) until recently, it can be noticed the contributions of Pulina and Santoni (2018) and Lado-Sestayo and Fernández-Castro (2019) with a comprehensive analysis of the main contributions on the application of DEA methodology to hotel sector. In fact, most recently there have been some contributions in literature using DEA methodology to compare the hotels efficiency, trying to identify which relevant characteristics may explain hotel efficiency. The vast majority of the studies using DEA approach considers hotels and not hotel companies. We will refer to the most recent ones.

The work of Pulina and Santoni (2018) explores the performance of the hospitality sector in Sardinia (Italy) using DEA analysis. The authors update literature review regarding DEA analysis on tourism destinations efficiency and on hotel efficiency. From this study empirical results show that, among other results, medium-sized hotels are characterized by growth in their efficiency especially during the economic crisis and that firms located in highly specialized areas with a strong seasonality are relatively inefficient. Literature review concerning hotel performance present the main issues being recently discussed: the impact of marketing, operational, environmental capability and diversification strategy on the performance of the hotel industry (Hathroubi, Peypoch, & Robinot, 2014; Ramanathan, Ramanathan, & Zhang, 2016); the fact that the hotel type (including location, branded affiliation or independent management) and size can affect overall performance (Devesa & Peñalver, 2013; Honma & Hu, 2012; Oukil, Channouf, & Al-Zaidi, 2016; Poldrugovac, Tekavcic, & Jankovic, 2016; Sami & Mohamed, 2014); the analysis of service quality and service effectiveness and the influence of internet marketing as drivers for hotel performance (Ercis, Dogan, Atilgan, Okumus, & Un, 2015; Shuai & Wu, 2011); how economic cycles and contextual factors, which impact on business conditions and influence hotel financial performance (Ben Aissa & Goaied, 2016; Sami & Mohamed, 2014).

There are few contributions in literature using DEA methodology to study hotel companies performance with branded versus non-branded hotel operation (Ben Aissa & Goaied, 2016; Devesa & Peñalver, 2013; Sami & Mohamed, 2014). To the best of our knowledge the present study is the first study to aggregate multiple financial indicators using the CI derived from DEA since previous studies use total operating revenue (Devesa & Peñalver, 2013) or total turnover (Ben Aissa & Goaied, 2016; Sami & Mohamed, 2014) as outputs to assess the impact of brands in hotel performance.

Excepting for Devesa and Peñalver's study (2013), it seems to be a gap concerning the issue of branding affiliation as a focus of the study using meaningful sample of hotel companies in a nationwide study. Also, there are few contributions in literature on the application of DEA methodology in the Portuguese case (Oliveira, Pedro, & Marques, 2015) and to a greater extend it has been applied to a small number of hotels (Barros, 2004, 2005, 2006; Barros, Peypoch, & Solonandrasana, 2009; Oliveira et al., 2015; Rebelo et al., 2013). The present work intends to fill a gap in literature studying Portuguese companies on the subject of branded versus non-branded hotel operation. The next section describes the methodology used in this work.

3- Methodology

DEA, initially proposed by Charnes, Cooper and Rhodes (1978), is a non-parametric method for assessing the performance of homogeneous Decision Making Units (DMU) that use multiple inputs to produce multiple outputs. The DEA uses the linear programming to identify the best practices DMU (the benchmarks) and their linear combination defines the frontier technology that envelops all DMU observed in the Production Possibility Set (PPS). If a DMU belongs to the frontier, it is classified as efficient. For the DMU located inside the PPS, it is classified as inefficient and the magnitude of its inefficiency is derived by the distance to the frontier and a single summary measure of efficiency is calculated.

This paper intends to assess the relative performance of hotel companies in terms of multiple achievements, considering an identical level of input for all companies (for simplicity the input level to be set to 1). Following the research line introduced by Lovell, Pastor and Turner (1995) and disseminated by Cherchye, Moesen, and Puyenbroeck (2004) in using optimization techniques to determine CI, this score is determined through the standard DEA model developed by Charnes at al. (1978). This model compares the relative financial performance of the hotel companies in producing financial indicators (as outputs) with a dummy input equal to one, attributed to all companies.

To formulate the DEA model to calculate CI, we consider a set of n hotel companies j $(j = 1, \dots, n)$ in producing multiple achievements given by s output indicators y_{rj} $(y_{1j}, \dots, y_{sj})$. Thus, for an input oriented perspective, the relative composite indicator CI_{j_o} of the assessed company j_o can be determined using the linear programming model (1) as proposed by Cherchye, Moesen, Rogge and Puyenbroeck (2007):

$$max\{CI_{j_o} = \sum_{r=1}^{s} u_r y_{rj_o} |$$

$$\sum_{r=1}^{s} u_r y_{rj} \leq 1, \quad j = 1, \dots, n,$$
$$u_r \geq \varepsilon, \qquad r = 1, \dots, s \}$$

(1)

Set u_r the output weight or multiplier associated with the output indicator r. For a given company, the objective of the multiplier model (1) is to calculate the optimal weight for each output indicator, in order to maximize the composite indicator score CI_{j_o} of company under assessment (j_o), keeping the composite indicator of all other companies less than or equal to one when evaluated with similar weights. Thus, a company is efficient, achieving a maximum score $CI_{j_o} = 1$, if there is no evidence, by comparison with other companies, that it is possible to obtain a higher weighted level of outputs, subject to the restrictions imposed. Therefore, if $CI_{j_o} < 1$ is derived, there is an evidence that other companies perform better than the company j_o under assessment. The model (1) is used to assess the hotel company's financial performance.

As cited by Cherchye et. al (2007), the DEA model presents several strengths to aggregate sub-indicators to derive the CI. Firstly, the CI is invariant to measurement units. Secondly, it endogenously generates the weights achieving "the benefit of the doubt" - weights for each evaluated company that emphasize its

strengths. Thirdly, the CI scores achieved from DEA are easy to interpret. Lastly, due to the non-parametric nature of DEA, the CI scores are estimated with reference to the "best observed practices DMU" frontier rather than on theoretical function.

To assure a fair comparison among hotel companies keeping the same orientation to the market, we run the model (1) in each segment, building a pooled frontier defined as the technology that envelops all branded and non-branded companies. In each segment, the model (1) enables to determine the overall performance, CI_{j_o}, for a given company to the pooled frontier, defined from all the observations belonging to brand and non-brand groups. Next section applies this methodology in each segment of hotel companies.

Empirically the present study aims to assess the financial performance of hotel companies that are established in Portugal (Portuguese companies) with a single or several hotel units. Concerning hotel operation, each company may have branded or non-branded hotel units and it does not have both types of operation. A brand operated hotel (opposite to independent operated hotel) is when a hotel unit uses a commercial brand shared with other hotels of the same hotel chain. For simplicity we will refer to branded companies and non-branded companies. Each hotel unit may have different quality indicators, considered for the purpose of this work as the certification standard (environmental or quality) and the number and type of the hotel facilities. These quality indicators are major basis for stars rating, according to Portuguese law. Concerning hotel facilities, each hotel can have restaurant service, conference room seats, SPA, outdoor swimming pool, indoor swimming pool, tennis or gym.

Data were collected directly from hotel branded companies or from hotel non-branded companies operating in Portugal. These companies were selected according to the Economic Activity Classification (CAE) 551 - "Hotel Establishments" (hotels, aparthotels and Pousadas) that correspond to public limited companies and limited liability partnership. Hotel data are extracted from their available financial statements available in 2017. The initial sample is comprised by 1258 companies.

According to the assumptions of DEA, it is necessary to improve the homogeneity of the companies and remove some outliers from the initial sample. To improve the homogeneity among companies required by the DEA methodology, we consider four segments of hotel companies according to stars ratings and market orientation: LS Leisure, LS Business, US Leisure and US Business. The US type includes hotel companies which hotels have the average number of stars at least equal to 4 while the LS type includes hotel companies which hotels' average number of stars ranges from 2.5 to 3.9. This implied to exclude 221 hotel units which have the average number of stars lower than 2.5. To mitigate the effect of outliers which can affect the location of the DEA frontier, 280 units were excluded from the sample as they present extreme scores in some indicators. Besides that, 187 units are eliminated from the sample as they have a negative score at least one financial indicator. Therefore, the final sample includes 570 companies classified in four segments, LS Leisure, LS Business, US Leisure and US Business.

There are several contributions in literature on used to measure hotel company performance (Kyriaki Pnevmatikoudi & Theodoros Stavrinoudis, 2016). As the focus of the present study is the financial performance assessment of hotel companies, the financial indicators are collected from their financial statements published in 2017 and available in Analysis of Iberian Balance Sheets (SABI) database from Bureau van Dijk.

The company performance is assessed through the model (1) by aggregating multiple financial indicators to determine its CI score. For the scope of the present study the financial indicators selected are Return on Sales (ROS), Return on Assets (ROA), Return on Equity (ROE) and Value Added per Employee (VAE). According to Molina-Azorín, Claver-Cortés, Pereira-Moliner and Tari (2009) the main indicators used to assess financial companies performance are ROS, ROA and ROE. These indicators are commoly used to assess financial performance of hotel companies and are classifyed as return on invested capital ratios (Pnevmatikoudi and Stavrinoudis (2016). As hotel companies are labor intensive, we also use Value VAE as a measure of financial performance.

There are several contributions in literature on the use of these indicators in assessing hotel companies' financial performance namely Marco (2012) (using ROA and ROE), Palacios-Marques, Ribeiro-Soriano

and Gil-Pechuan (2011) (using ROA, ROE, ROS and an indicator similar to VAE), Chen (2011) (using ROE and ROA) and Aissa and Goaied (2016) (using ROA).

The ROS is calculated as Operating Profit Before Interest, Taxes and Depreciations (EBITDA) divided by total sales ($\frac{EBIT}{Total\ sales}$), representing the profitability per euro sold. The ROA is calculated as net income divided by total assets ($\frac{Net\ income}{Total\ assets}$), measuring the profit per each euro invested on assets. The ROE is calculated through the net income divided by the total equity ($\frac{Net\ income}{Total\ equity}$). It assesses the profitability per each euro invested by shareholders in the company.

The VAE is computed as gross value multiplied by 10^3 and divided by the number of employees ($\frac{Gross\ value*10^3}{No\ of\ employees}$), indicating the medium contribution for the company wealth per employee. These indicators correspond to the achieved outputs normalized by the resources used, otherwise the comparison between companies would be impaired (Horta, Camanho, & Costa, 2012). As these indicators are desirable outputs, no transformation is required.

4- Data and variables

As summarized in Table 1, the LS Leisure segment comprises 145 companies, including 15 units in the branded group and 130 units in the non-branded group. The LS Business segment contains 107 companies, including 21 units in the branded group and 86 units in the non-branded group. The US Leisure segment comprises 132 companies, including 34 units in the branded group and 98 units in the non-branded group. The US Business segment contains 186 companies, including 68 units in the branded group and 118 units in the non-branded group. Each segment includes the branded and the non-branded companies which are identical in terms of stars rating and market orientation, removing exogenous factors than can interfere in the comparison.

Table 1 also summaries the average, standard deviation (SD), maximum (Max), minimum (Min) of indicators used in assessing hotel companies' financial performance in each segment and its size (*n*).

Table 1: Descriptive statistics in each segment

	US type				LS type			
	ROS	**VAE**	**ROE**	**ROA**	**ROS**	**VAE**	**ROE**	**ROA**
	Brand US Leisure group				**Brand LS Leisure group**			
Average	19.5	56.4	29.6	16.8	18.3	43.8	32.6	20.5
SD	9.7	25.8	37.2	14.7	9.4	24.6	26.2	16.4
Min	0.7	15.9	0.3	4.7	4.9	13.3	4.8	6.3
Max	39.2	118.5	156.3	68.7	43.0	108.0	93.6	63.3
n	*34*				*15*			
	Non-branded US Leisure group				**Non-Brand LS Leisure group**			
Average	15.2	38.6	20.6	14.2	15.0	30.2	26.1	20.5
SD	16.8	24.2	25.2	8.4	9.9	14.0	24.4	13.4
Min	0.5	11.2	1.0	3.1	0.5	11.7	0.6	2.9
Max	101.1	136.3	153.6	39.6	44.3	108.6	151.9	67.8
n	*98*				*130*			
	US Leisure segment				**LS Leisure segment**			
Average	16.3	43.2	22.9	14.9	15.3	31.7	26.7	20.5
SD	15.4	25.8	28.9	10.4	9.9	15.9	24.6	13.7
Min	0.5	11.2	0.3	3.1	0.5	11.7	0.6	2.9
Max	101.1	136.3	156.3	68.7	44.3	108.6	151.9	67.8
n	*132*				*145*			
	Brand US Business group				**Brand LS Business group**			
Average	17.9	50.0	26.9	15.9	14.8	51.0	30.6	12.7
SD	10.4	28.5	22.6	11.0	12.1	35.6	37.0	7.4
Min	1.0	15.7	0.8	2.1	2.1	19.2	1.0	2.1
Max	51.3	153.7	95.4	59.5	46.4	136.7	142.4	30.3
n	*68*				*21*			
	Non-brand US Business group				**Non-brand LS Business group**			
Average	12	35.5	20.6	14.5	12.3	27.9	22.5	16.3
SD	8.2	17.2	26.3	10.4	9.6	13.7	27.5	11.5
Min	0.6	12.8	0.5	2.8	0.2	12.3	0.2	2.6
Max	44.2	159.8	134.2	67.7	39.5	81.8	147.6	65.0
n	*118*				*86*			
	US Business segment				**LS Business segment**			
Average	14.2	40.8	22.9	15.0	12.8	32.4	24.1	15.6
SD	9.5	23.0	25.1	10.6	10.1	21.8	29.6	10.9
Min	0.6	12.8	0.5	2.1	0.2	12.3	0.2	2.1
Max	51.3	159.8	134.2	67.7	46.4	136.7	147.6	65.0
n	*186*				*107*			

In general terms, and considering the different segments and groups, Table 1shows that the brand hotel companies have better indicators than the non-brand ones.

5- Performance assessment

The performance assessment methodology is applied in each of the four segments (LS Leisure, LS Business, US Business and US Leisure), separately. In each segment, the DEA model (1) enables to measure the overall performance (CI). Thus, the overall performance for each company is calculated against to the pooled frontier defined by all brand and non-branded companies in each segment. Table 2 summarizes the number of efficient companies, the average and the standard deviation (in brackets) of the overall performance in each segment and branded and non-branded groups.

In all segments, Table 2 shows that branded companies have, on average, significantly, higher overall performance than the non-branded companies. It is necessary to explore whether this superiority for branded companies is due to their best practices or/and their higher relative performance. It is observed that the best practices are observed in both branded and non-branded companies, in all segments.

In terms of best practices in Business segments, it is observed that approximately 50% of all companies in the pooled frontier are branded and non-branded companies. In LS Business segment, the benchmarks for all inefficient branded companies are the branded companies (43%), the linear combination between branded and non-branded companies (57%). The benchmarks of inefficient non-branded companies are some non-branded companies (6%), branded companies (12%) or the linear combination between branded and non-branded companies (83%). This behavior is slightly different in the US Business segment. The benchmarks for inefficient branded companies are the branded companies (13%), the non-branded companies (6%) or the linear combination between branded and non-branded companies (81%). The benchmarks of inefficient non-branded companies are some non-branded companies (9%), the branded companies (29%) or the linear combination between branded and non-branded companies (62%).

In terms of best practices, in Leisure segments, it is observed the majority of the companies in the pooled frontier are non-branded companies. Although, this result can be affected by the highest number of the non-branded companies in Leisure segments. In LS Leisure segment, it is observed that approximately 83% of all companies in the pooled frontier are non-branded companies, while this score is 63% in US Leisure segment. In LS Leisure, the benchmarks for inefficient branded companies are the branded companies (7%), the non-branded companies (67%) or the linear combination between branded and non-branded companies (27%). The benchmarks of inefficient non-branded companies are only non-branded companies (53%) or the linear combination between branded and non-branded companies (47%). In US Leisure segment, the benchmarks for inefficient branded companies are the branded companies (9%), the non-branded companies (15%) or the linear combination between branded and non-branded companies (76%). The benchmarks of inefficient non-branded companies are some non-branded companies (9%), the branded companies (1%) or the linear combination between branded and non-branded companies (90%).

Table 2 Results of average *CI* scores in each segment and groups (branded and non-branded)

	No DMU	Overall performance (CI)	Number of efficient companies
LS business	107	0.47(0.25)	8
Branded	21	0.60**(0.29)	4
Non-branded	86	0.44**(0.23)	4
LS Leisure	145	0.53 (0.23)	6
Branded	15	0.64* (0.23)	1
Non-branded	130	0.52* (0.22)	5
US-business	186	0.49 (0.23)	9
Branded	68	0.57** (0.23)	4
Non-branded	118	0.44** (0.22)	5
US-Leisure	132	0.46 (0.22)	8
Branded	34	0.55** (0.23)	3
Non-branded	98	0.42**(0.21)	5

[**]Non-parametric Test Mann–Whitney test significant at 1% level.
[*]Non-parametric Test Mann–Whitney test significant at 5% level.

In terms of overall financial performance, we may observe that the companies within LS Leisure segment have the highest homogeneity ($CI = 0.53$) while the companies within US Leisure group have the highest heterogeneity ($CI = 0.46$). Thus, in each segment, the hotel companies have high potential to improve their performance by adopting the best practices observed in their benchmarks. This can be explored by comparing the financial indicators between benchmarks (CI=1) and inefficient companies' groups (branded and non-branded) as shown in the radar graphs presented in **Erro! A origem da referência não foi encontrada.**. Each graph shows for each segment, the average scores of the financial indicators for benchmarks companies and for each group of inefficient companies. The scores for each group of inefficient companies are normalized by the average scores observed in benchmarks to simplify the comparison.

In all segments, the branded inefficient companies present, on average, scores of ROS, VAE and ROE closer to the ones observed on benchmarks than that scores in the non-branded inefficient companies, except for the ROA. This means that the branded inefficient companies are closer to the benchmarks than the non-branded companies, in all segments. This implies that globally branded inefficient companies have on average higher relative performance than the non-branded inefficient. In the case of US segments (Business and Leisure), the ROA is slightly higher in branded inefficient group. In the case of LS segments (Business and Leisure), the average of ROA is higher for non-branded inefficient group, showing that these companies achieve higher profit per euro invested in assets than the branded inefficient companies.
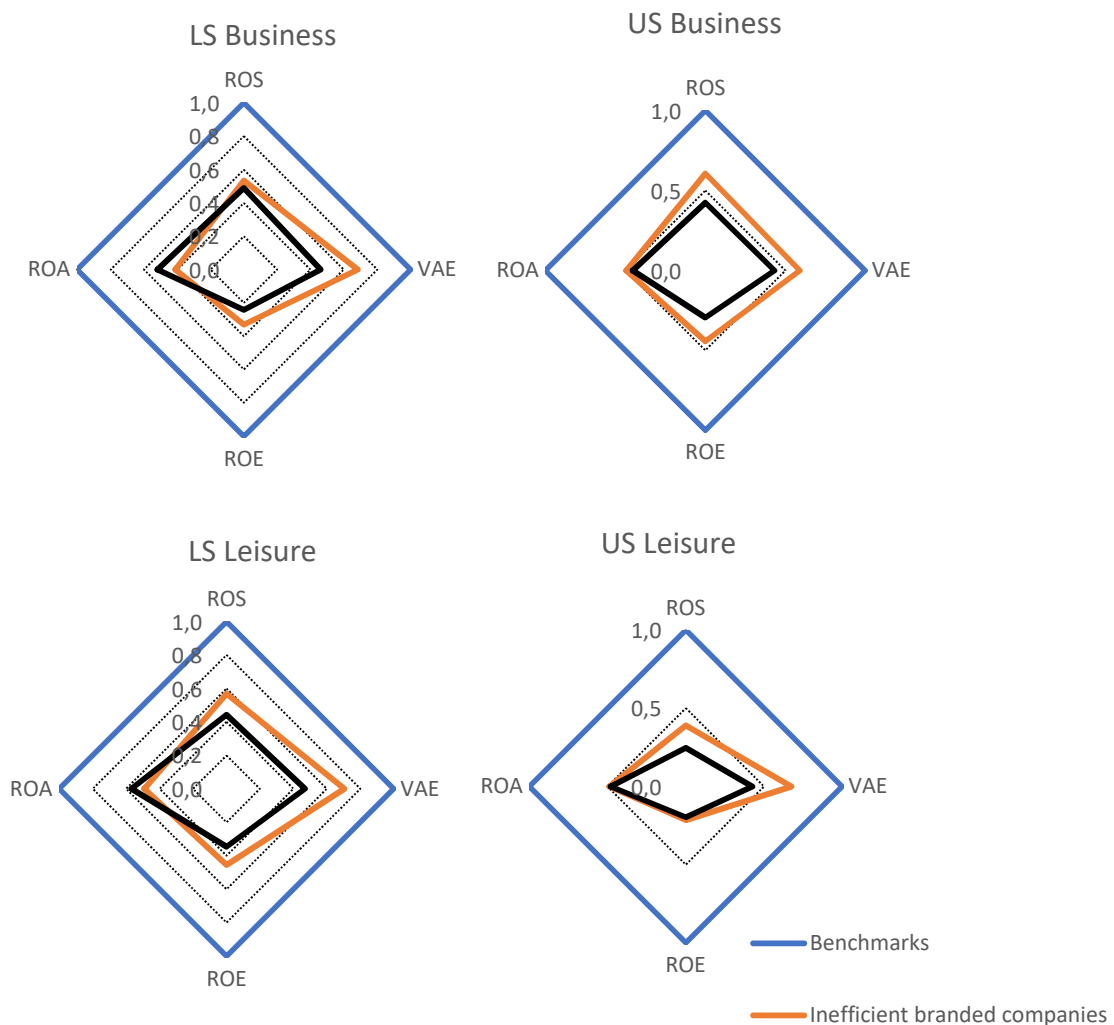
Figure 1: Comparison between benchmarks and inefficient branded and inefficient non-branded companies, in each segment.

These results tend to corroborate other contributions in literature namely the work of Devesa and Peñalver (2013) who also conclude that branded operated hotels (managed by hotel chains) operate with a higher production function than independent properties. Likewise it corroborates the contributions of Hwang and Chang (2003) and Chiang (2006) who conclude that franchised hotels and those managed by international operators perform more efficiently than the independently operating ones. Manasakis at al. (2013) also concludes that hotels operating under a national brand are more efficient than independently operated hotels since these have the maximum potential for flexibility, yet, they have no branding potentials to exploit. In fact, the advantage of independently operated hotels stands in its capacity do adapt to markets in several aspects like localization, differentiation and dimension. Tough, they hardly can compete in international markets and define strategies of international growing, being more vulnerable when compared to hotel chains (Cunha, 2019). Furthermore, as Carvell et al. (2016:7) notes "the distribution channel management systems, loyalty programs, and corporate and group business sales programs of brand affiliated hotels are able to produce a significantly higher number of rooms sold regardless of the market size and market segment".

In Business segments, the best practices are observed in branded and non-branded companies. This can be explained by the fact that Business segment is a more complex segment than Leisure segment concerning client satisfaction (Radojevic, Stanisic, Stanic, & Davidson, 2018). Therefore, in Business segment hotel companies, branded or non-branded tend to perform better in order to satisfy more demanding costumers.

In the Leisure segment, the best practices are much more observed in the non-branded companies, for both group' stars. These findings do not support the study of Ivanova and Ivanov (2015) where Bulgarian managers of more leisure oriented hotels tends to believe that chain's brand image helps hotels to distinguish on the highly competitive mass tourism leisure market. On the other hand the results of the present study corroborate the findings of Hwang and Chang (2003) who conclude that Taiwan Leisure hotels are better managed than their urban (Business oriented) counterparts as far as international tourist hotels are concerned. Also, according to sample, Portuguese hotels are in a larger number non-branded (76%) compared to branded, therefore these results can also be explained by the highest number of non-branded companies compared to branded companies in the Leisure segment. Further, Portugal is experiencing a continuous growth in tourism sector in recent years. In fact, since 2015 Portugal has growth 45% in tourism receipts and 51% in hotel profits (AMBITUR, 2019). According to O'Neill and Carlbäck (2011) independently operated hotel companies are more flexible to make up to increase rates in periods of growth than branded ones, without affecting occupancy.

Acknowledgment

6- Conclusions

The present study adopts a concise approach to assess the financial performance of 570 hotel companies, in 2017, allowing for comparison among hotel companies with similar stars rating and market orientation to explore the question regarding brand affiliation versus independent operation. This issue is studied using the DEA methodology to assess the overall performance for each company. The hotel company performance is assessed through the aggregation of multiple financial indicators using the CI derived from the DEA model (Cherchye et al., 2007).

This study has some important contributions to literature, since, to the best of our knowledge, there are no studies on hotel company's performance using a CI based on DEA model. Furthermore, the empirical results allow for some important conclusions that can be used to support the strategic decision process of the hotel companies in choosing to operate independently or adopt brand affiliation.

The empirical results show that branded companies have, on average, significantly, higher overall performance than non-branded companies. The superiority for branded companies is due to their best practices and their higher relative performance. Although, that the best practices are observed in both branded and non-branded companies, in all segments. Globally, the branded inefficient companies have on average higher relative performance than the non-branded inefficient companies. This can indicate that the brand could impose best practices that are more pursued by the branded companies than the non-branded companies corroborating the work of Devesa and Peñalver (2013) who also conclude that branded operated hotels operate with a higher production function than independent properties. Besides hotels using the same brand are required to comply with defined rules and are subject to permanent control by the organization managing or supervising the common brand.

In terms of the benchmarks, in Business segment the best practices are observed in similar number of branded and non-branded companies while in the Leisure segment, the best practices are observed in larger number of non-branded companies. These findings could be explained by the highest number of non-branded companies in the Leisure segment, particularly in the LS Group.

Globally in all segments, the companies have high potential to improve their performance, particularly in the case of non-branded companies. Thus, the inefficient companies should adopt the best practices observed in their benchmarks to increase their financial indicators.

This study compares the financial performance of branded and non-branded Portuguese hotel companies. Future research may be extended to assess the operational performance of hotel companies and to include a measure of brand awareness to explain performance in Leisure and Business segments. Another perspective should be to consider longitudinal data, in order to assess the brand effect in companies' performance before and after brand operation.

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