



Efficiency and its determinants in Portuguese hotels in the Algarve

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H I G H L I G H T S

- ▶ We measure the efficiency of Portuguese hotels in the tourism region of the Algarve.
- ▶ Robust non-parametric methods are applied to compare the performance of hotels.
- ▶ The paper provides evidence of higher efficiency in hotels without golf courses.
- ▶ Results show that hotel star rating is not a relevant issue for their performance.

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This paper uses non-parametric techniques to investigate and compare the efficiency of Portuguese hotels in the Algarve, the comparison being made between those hotels possessing golf courses and those that do not. The Algarve is one of the more important tourism locations in Portugal and a popular destination for tourists from many countries and specifically attracts tourists seeking to play golf. By using data envelopment analysis (DEA) this study investigates the influence of star ratings, golf courses and location on hotel efficiency. Additionally the study uses the test devised by Carvalho and Marques that takes into account the equality of the entire efficiency distribution. We conclude that star rating is not a significant determinant of efficiency but location and the existence of golf courses may have some relevance. A major finding is that it is those hotels that do not possess golf courses that are the more efficient.

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1. Introduction

The Algarve is a tourism region in Portugal that traditionally attracts the major part of domestic Portuguese tourists as well as tourists from other countries of Europe and the world. It is one of the main tourism destinations for visitors from countries of Northern and Central Europe, and it was ranked as the 10th European and the 20th world destination by the UNWTO in 2007. In addition to its attractive beaches, the tourism offering in the Algarve focuses especially on golf.

The golf product has undergone strong expansion in Portugal, both in quantity and in reputation. In 2006 it accounted for 6.3% of the reasons given by foreign tourists for visiting Portugal (PENT, 2007). The Algarve has more than 40% of the golf courses in the country (31 out of 70) and enjoys high international rankings that contribute to the area's attraction as a tourist location for both the

domestic and international market. For example, the Algarve was considered the '*Best Worldwide Golf Destination*' several times in the last decade by the *International Association of Golf Tour Operators* (IAGTO), and was identified by the same organization as a golf destination of first choice. Additionally, the Algarve golf courses were also acclaimed by '*Rheingolf Magazine*' and '*Golf Digest*' that ranked the San Lorenzo and Vilamoura Old Course among the 100 best golf courses in the world. The hotels with golf courses are generally rated 5-star. There are 28 5-star hotels in the Algarve (7.3% of the total) and of these 29% have golf courses.

Based upon its geographic and climatic features, the Algarve can be further divided into the *windward* and *leeward* sub-regions, in the west and east respectively. This has implications for the patterns of weather, and from a golfer's perspective, the pattern of prevailing winds.

Given the importance of the Algarve, and the contribution made by golf toward its destination image, this paper seeks to assess the efficiency of the hotels by the use of data envelopment analysis (DEA) and to assess to what degree association with a golf course impacts upon a hotel's operational efficiency. In doing so it builds upon the work of Barros, Botti, Peynoch and Solonandrasana (2011)

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and their study of Portuguese hotels, by comparing the efficiency of 4-star and 5-star hotels and also those with and without golf courses. Furthermore, the efficiency of the hotels of the two sub-regions is also compared. DEA has numerous advantages over other (parametric) methods (e.g. stochastic frontier analysis – SFA) since it does not require any *a priori* assumption of a function to represent the production or cost frontier, neither does require as many data assumptions as parametric methods with, for example, respect to normality of distribution, independence of variables or assumptions relating to error terms (Kumbhakar & Lovell, 2000). A sample of 84 hotels for the years 2005–2007 is used in this investigation.

This paper makes several contributions to the literature. The first concerns the novelty of investigating the determinants of efficiency using non-parametric methods, particularly the influence of star ratings and the existence of golf courses. Second, robust methods are used to compare the statistical distributions of efficiency and a new statistical test is applied. Finally, it is the first time that the efficiency of hotels specific to the Algarve has been analyzed and this still remains (thus far) as one of the few studies of this nature in Portugal.

The remainder of the paper is organized as follows. Section 2 presents a literature review on hotel efficiency. Section 3 introduces the methodologies adopted and proposed for this research. Section 4 describes the case study on efficiency estimation and its determinants, comprising 84 Portuguese hotels in the Algarve and, finally, and Section 5 presents the concluding remarks.

2. Literature review

2.1. Efficiency and tourism

Hotels must compete globally to attract customers (Tarim, Dener, & Tarim, 2000), yet in doing so are still required to achieve desirable rates of return. This issue alone would be enough to place efficiency and its measurement at the top of the agenda for managers. Yet studies of this kind are a relatively new area of research in the field of tourism. As Davies (1999, p. 296) notes, "... it is surprising that the literature of IO (industrial economics) has little to say about this area of economic activity."

According to several authors (Anderson, Fok, & Scott, 2000; Barros & Dieke, 2008; Barros, Peypoch, & Solonandrasana, 2009; Chen, 2007), in the past, performance evaluation was restricted to performance indicators. However, as these are partial measures of productivity, and do not take into account either the multiple variables of the hotel industry, or the interactions between them, it is suggested that these measures have not been wholly effective. Recently, methods such as SFA or DEA have included multiple inputs and outputs of the hotel industry in their analysis and as a result they have produced more comprehensive, accurate and understandable performance measures.

Several studies in the literature apply DEA to determine the efficiency of hotels. For example, Hwang and Chang (2003) evaluated performance as an important part of management control, and studied efficiency measures in the hotel industry in 45 international hotels in Taiwan. Anderson, Fish, Xia, and Michello (1999) discussed the difficulties of measuring the efficiency of hotels. They concluded that efficiency in the management of resorts (hotels with leisure segments) was greater than that of business hotels that primarily provided solely accommodation, and additionally that efficiency in the management of international hotels that chiefly dealt with foreign tourists was greater than that of hotels whose core clients were domestic tourists. They also

suggested that efficiency in the management of hotels that are part of a hotel chain is greater than that of independent local hotels. Rodriguez and Gonzalez (2007) studied the efficiency of hotels located in Gran Canaria (Spain) over a period of 10 years, concluding that inefficiency was common with serious consequences in terms of costs. The authors also concluded that economies of scale in this industry mainly depend on the size of firms. According to Hwang and Chang (2003), efficiency may be related either to differences in the type of tourists or to the style of management. In turn, Barros, Dieke, and Santos (2009) studied the efficiency of hotels in Luanda (Angola), suggesting that hotels that adopt strategic approaches get better results and, therefore, are more efficient than more short-term oriented hotels. Other studies, such as Barros, Botti, Peypoch, Robinot et al. (2011), have focused on the competitiveness of the destination. Finally, Asalos and Trandafir (2009) suggest that the heterogeneity and complexity of the tourism product actually demands a wider scope of coverage and evaluation of efficiency when compared with other industries. They conclude that economic efficiency in tourism is very complex because it is the result of a wide range of activities including domestic tourism, international tourism, food, services, and sale of advertising and transportation, among others. Additionally tourism activity comprises two simultaneous aspects of efficiency that interact with each other, namely economic and social efficiency.

2.2. Efficiency of 4- and 5-star rated hotels

The star rating of hotels aims to harmonize international standards in order to differentiate and improve hotel facilities and services. However, there is no universally accepted and adopted rating system. The World Hotel Rating Agency, headquartered in Belgium, is the international institution most often used to classify hotels. Having a greater number of stars suggests more luxury, and better services, food and beverages, entertainment, panoramic views and a variety of rooms of different sizes. Additional requirements, such as spa centres and fitness facilities, as well as location, are also commonly considered in the definition of a standard. Nevertheless, a greater number of stars do not necessarily correspond to greater efficiency and greater profitability.

Using room segmentations and price guide as a model, Smith (1999) and Ismail, Dalbot, and Mills (2002) ranked each hotel in one of five price segments of the market: luxury (upper scale), upscale, mid-price, economic and budget, and examined the portfolio of each multi-brand hotel company. These studies suggested that a higher star rating permitted higher occupancy levels and higher levels of quality.

Regarding star rating performance, Ray and Phillips (2005) suggest that the greater the number of stars, the better the performance. They suggest that this may be related to the fact that the property is associated with foreign partners who bring better and more experienced management techniques, modern technologies and (foreign) customers who spend more. Assaf and Agbola (2011) suggest a positive relationship between the number of stars and efficiency. Khataei, Farsin, and Mousavi (2008), in a study of luxury hotels in Tehran, Iran, observed that 5-star hotels are more efficient than 4-star hotels.

However, Chen (2007) states that there are greater efficiency differences between 4-star hotels and yet nevertheless as a group they perform better than 5-star hotels. Tarim et al. (2000) also argue that 4-star hotels are technically more efficient (72%) than 5-star hotels (52%) and suggest that the major difference between 4- and 5-star hotels is the fact that 5-star hotels provided less satisfactory services for their clients (who are more demanding with higher expectations) and less profit.

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