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Efficiency performance of the Algarve hotels using a revenue function

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ABSTRACT

The tourism industry, particularly the hotel sector, is becoming increasingly competitive and dynamic as a result of the pressures of globalized supply and demand in a context of uncertainty. The aim of this study is to discuss the efficiency of hotel companies in the Algarve (Portugal), a tourist destination of excellence in southwest Europe. In particular, we intend to assess the efficiency of the hotels in terms of star rating (four and five-star hotels), their location (Windward and Leeward), owning or not golf courses and owning just a single hotel or more than one. This analysis will be based on the parametric method of stochastic frontier approach using a revenue function. We found relevant levels of inefficiency. The results also point out the important role of the operational environment, particularly the hotel location and the existence of golf facilities. Star rating and owning multiples hotels do not seem to be so relevant.

1. Introduction

The tourism industry, particularly the hotel sector, is becoming increasingly competitive and dynamic motivated by the pressures of globalized supply and demand (COM, 2010). However, it is also characterized by a context of uncertainty, despite the growth trend. This motivates the search for continuous and systematic improvement of processes and resources toward efficiency. Many authors have studied the efficiency, including Phillips (1999), Barros (2004) and Chen (2007), all pointing to the improvement of management practices. Differences in markets, tradable products, quality, location, differentiation and price, among other aspects, can generate the critical factors of success and survival of these organizations.

Algarve is a tourist destination of worldwide excellence. It was considered two times the best worldwide golf destination in the last decade by the International Association of Golf Tour Operators (IAGTO, 2013). The Algarve golf courses were also distinguished by Rheingolf Magazine and by Golf Digest, putting San Lorenzo and Vilamoura Old Course between the 100 better golf courses of the world. Recently, in European Gala of World Travel Awards Europe (WTA, 2012), the Algarve was considered the best beach destination of Europe and Portugal was deemed the best golf destination. Also Hotel Quinta do Lago was considered the best hotel of the Mediterranean area, while Martinhal Beach was the best villa resort, the Dunas Douradas Beach Club, the best villas and apartments complex and Conrad Algarve Hotel (Hilton Group) the best new resort of the world. Graham Cooke, President of WTA, underlined that the "Algarve is also one of the most beautiful coastline of the world". The Algarve has an area of 5412 km^2 with approximately 450 thousand inhabitants but receives an average of 7 million foreign tourists each year.

Despite this, it is essential that hotel companies improve or, at least, maintain their performance levels, so that the Algarve will continue to be a desired place. This study aims to analyze the efficiency of hotel companies in the Algarve and simultaneously to assess the influence of certain exogenous variable on the efficiency of these companies. These variables are: location (Windward and Leeward), star rating (four and five-star hotels), owning golf courses or not and owning only one hotel or more than one. Taking into account the available data and the Algarve setting, we believe that these 'explanatory' factors might be the most determinant in the performance highlighted. On the one hand, there is no consensus if the existence of golf facilities, star-rating or the number of hotels of the same company influence positively the performance and, on the other hand, location is surprisingly very relevant with Windward and Leeward presenting significant differences and features. In this study, a revenue function was estimated through the stochastic frontier approach (SFA) methodology. As far as we know, it is the first study using a revenue function and also the first time that the hotel efficiency in the Algarve is analyzed using the SFA methodology, so this work is considered pioneer.

The assessment and analysis of efficiency using the SFA methodology has been the target of a number of studies since the 80s to the more recent: Assaf et al. (2012), Assaf and Barros (2011) and Pérez-Calderón et al. (2011). A number of authors have been addressing this issue, but all of them estimate cost functions. The literature review carried out for this research, which will be presented in Appendix A, enabled us to find 20 studies worldwide, 10 in Asia, 7 in Europe, two in North America and one in Africa. From

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the 7 studies in Europe, 4 (57%) were made in Portugal and from the 10 in Asia 8 (80%) were applied in Taiwan. In this survey, the author with the largest number of publications was Barros, with 6 studies (2 individually), followed by Assaf with 3 papers. In this survey, the most used variables as inputs were the cost of labor (13), the number of employees (9), the capital (9), the number of rooms (7), the operating costs (6), the F&B costs (5) and the space of F&B (3). Regarding the outputs, the more used variables were the total revenue (7), the room revenue (4), the F&B revenue (4), the other revenue (4) and the sales (4). As referred to, no study was found in the hotel efficiency literature using the revenue function. Since the hotel sector is profit oriented, it makes sense to consider this specification and thus this paper can give a sound contribution to the literature. In addition, the case study is still little studied and it is important to investigate the influence of the explanatory factors on the performance.

Following this introduction, the paper is organized as follows. Section two presents a literature review on hotel efficiency using the SFA methodology and a cost function, the third describes the methodology used, the fourth presents the case-study, the fifth shows the results and their discussion and, finally, the sixth draws the major conclusions and makes some considerations about future research.

2. Literature review

According to the literature review, we found several studies related to hospitality and the SFA methodology to analyze efficiency. The specifications regarding the sample, methodology and the variables most commonly used in the studies are specified in Table 1.

Several and different issues were investigated in the literature. For example, Assaf and Barros (2011) concluded that cost efficiency of the hotels of Luanda (Angola) is still low, although it increased over the period of study and reached an overall average of 67.11%. This study also presents market trends and mentions the need for investment and the management control and focuses on government policies to generate significant increases of cost efficiency. Assaf and Magnini (2012) studied the role of clients' satisfaction on the efficiency of eight hotel chains in the United States of America. The conclusions suggest that including the variable "clients satisfaction" the average efficiency corresponds to 89.5%. Excluding that variable, it is just 80.2%. These authors say that "clients' satisfaction" has an important influence on efficiency levels because it is associated with loyalty, thus allowing to reduce costs of future transactions and also price elasticity's.

Pérez-Calderón et al. (2011) studied the energy consumption of European hotels between 2004 and 2007. The hotels of higher dimensions presented high inefficiency, although better performances in 2007. They found no positive correlation between profitability of these hotels and efficiency. They concluded that hotels with higher scale have increased the sense of savings of energy and got better performances due to their higher level of resources. On the other hand, the investments made increased the level of efficiency in 2007, although with a negative impact on the economic and financial return.

Yi-Hsing (2011) concluded that in contrast with previous studies, this study found no significant differences between average cost efficiency of metropolitan hotels of Taipe comparing them with non-metropolitans ones. However, the average cost efficiency of small-scale hotels is significantly higher than that of large-scale hotels. The average cost efficiency of domestic chain hotels is clearly higher than that of independent hotels, which is in turn higher than the average cost efficiency of international chain hotels. Khrueathai et al. (2011) studied the operational efficiency and technology gap for hotels in Thailand. The findings suggest that the efficiency and the technological variation ratio is significantly different between hotels and within groups of hotels. The average operational efficiency of each hotel on the frontier, the group of hotels on the frontier and all groups are respectively 0.90, 0.83 and 0.53. The results suggest that to transfer technology and management technology on operations management of hotels with high efficiencies to the ones with low efficiency, requires organization. They concluded that the effectiveness of foreign hotel groups is higher than of domestic hotels and that hotels can get revenue from other sources of income, such as entertainment and F&B.

Assaf et al. (2012) using a panel data sample of 78 Taiwanese hotels concluded that the hotel chains have significantly higher efficiencies than independent hotels. The average efficiency for chains and independent hotels is respectively 77.2% and 73.3%. They also concluded that the ratio of technology gap of independent hotels have achieved only 77.2% of its potential output, while the hotel chains have reached 87.5%. They also observed that large hotels have better returns than those of small size and in terms of average efficiency groups. Larger hotels have efficiencies levels of 73.2% and 70.1% while the small size ones have respectively 68.2% and 63.2%.

In this study we investigate the efficiency of hotel companies in the Algarve (Portugal) using the parametric method of stochastic frontier with a revenue function. Particularly we observe the influence of the star rating (four and five-star hotels), the location (Windward and Leeward), the owning or not golf courses or just a single hotel or more than one hotel on efficiency.

3. Methodology

3.1. Overview

The frontier methods have been increasingly used in the literature on the estimation of production or cost functions because they also enable us to estimate efficiencies of observations. These methods aim to find the best practice observations (that constitute the frontier) allowing then the estimation of the efficiencies of the other observations from this frontier. So, efficient decision units operate at the production or cost frontier with efficiencies equal to one, while inefficient ones operate below the production frontier or above the cost frontier and have efficiencies less than unity (Chen, 2007).

The best known and widely used econometric methodology for estimating efficiency are the stochastic frontiers which had origin in the independent works of Aigner et al. (1977), Meeusen and Van den Broeck (1977) and Battese and Corra (1977). The major principle associated with the efficiency measurement derived from the work of Farrell (1957) on which it was proposed to measure the efficiency of a decision unit through the deviations from an isoquant curve – the idealized frontier.

SFA is an econometric regression used to predict the behavior of a dependent variable from one or more independent variables, reporting on the margins of error of these forecasts. More specifically, concerning the efficiency estimation, the parametric methods aim to derive a relationship between the performance of an organization, the market conditions and the characteristics of the production processes.

3.2. Advantages and limitations

According to Chen (2007), for example, the cost function of a company depend on the output vector (Y), the price of the input (w), the level of cost inefficiency (u) and a set of random factors (v). The cost function frontier is expressed by:

$$C(y, w, u, v) = f(y, w)\ \exp(u + v) \quad (1)$$