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Impact of quality on estimations of hotel efficiency

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HIGHLIGHTS

- The hotel industry is operating with substantial profit inefficiencies.
- The quality of hotel services has a significant impact on overall efficiency.
- Profit efficiency is more relevant than cost efficiency when output quality differs.

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ABSTRACT

This paper provides empirical evidence on the impact of output quality on hotel efficiency. It demonstrates how ignoring quality can lead to erroneous efficiency estimates. The study uses stochastic frontier methodology and the model proposed by Battese and Coelli (1995) to estimate the efficiency of 838 hotels in Spain in the period 2009–2013. The key advantage of this methodology is its ability to estimate efficiency and identify factors that explain differences in efficiency in a single-stage sampling procedure. Estimates of cost efficiency, which only include the costs of higher quality, are compared to those of profit efficiency, which not only consider costs but also the revenues generated by higher quality. Results show that quality has a negative impact on cost efficiency and a positive one on profit efficiency. Thus, hotel management should implement strategies that increase the value of their services as a way to achieve sustainable competitive advantages.

1. Introduction

In the last decade, numerous studies have been published on efficiency in hotel companies (Assaf & Magnini, 2012; Barros, 2005; Barros, Dieke, & Santos, 2010; Bernini & Guizzardi, 2010; Chen, 2007; Fernández & Becerra, 2015; Hadad, Hadad, Malul, & Rosenboim, 2012; Jorge & Suárez, 2014; Parte-Esteban & Alberca-Oliver, 2015; Such-Devesa & Mendieta-Peñalver, 2013; Untong, Kaosa-Ard, Ramos, & Rey-Maquieira, 2011; Wang, Hung, & Shang, 2006a, 2006b; Wang, Lee, & Wong, 2007; among others). All these studies have followed a standardized methodology and conceptual framework focusing on minimizing hotel costs (cost efficiency) under given production conditions. From our point of view, the concept of cost efficiency presents an important limitation, since it does not capture differences in the service quality of hotels. This omission can lead to erroneous efficiency estimates.

Quality has become a key factor as a differentiator to succeed and survive in highly competitive sectors such as the hotel sector (Akbaba, 2006; Chen, 2013; Cheng & Rashid, 2013). Quality ensures loyalty among customers, attracts new ones and increases reputation and revenue (Berry, Bennett, & Brown, 1989; Chen, 2013; Saleem & Raja, 2014).[1] In this sense, a correct measure of efficiency should take into account both output quantity and their quality (Assaf & Magnini, 2012).

If quality differences (i.e. vertical differentiation) in hotel services are not taken into account and given that higher quality implies higher costs, considering these higher costs as inefficiencies would lead to errors in efficiency estimates. These errors would result from the unmeasured differences in the quality of the hotel services. It should be noted that quality does not just mean higher costs but also higher revenues due to the market power of pricing,

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[1] For a thorough study of the importance of quality in the provision of hotel services, consult Callan and Kyndt (2001); Min, Min and Chung (2002); Tsaur and Lin (2004); Ladhari (2009); Mohsin and Lockyer (2010); Marković and Raspor Janković (2013) and Minh, Ha, Anh and Matsui (2015).

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which is derived from specialization or from a different output composition. This higher revenue can offset higher costs. In this way, measures of cost inefficiency can be contaminated by the composition of the output, since higher quality output could be more expensive but not necessarily more inefficient (Maudos, Pastor, Perez, & Quesada, 2002). By contrast, the concept that better reflects the effects of quality on both costs and revenue and their interaction is profit efficiency, as this concept is based on the widely accepted economic objective of profit maximization.

Profit efficiency captures unmeasured differences in output quality, since it considers both increased costs and increased revenues resulting from higher quality. If the market is competitive and customers are willing to pay for better quality services that some hotels offer, these hotels could obtain higher revenues, which would compensate for the extra quality costs. Therefore, given the gaps in the literature on hotel efficiency regarding differences in service quality, the objective of this paper is to estimate profit and cost efficiencies and to investigate the impact of quality on the overall efficiency of hotels.

This paper contributes to the existing literature on hotel efficiency in two ways. First, cost efficiency and profit efficiency are estimated for a sample of 838 hotels in Spain between 2009 and 2013. As mentioned previously, numerous studies have focused on estimating cost efficiency in the hotel sector. However, there have been very few on profit efficiency, even though empirical evidence in other sectors has shown that profit inefficiencies are much more important than cost inefficiencies. Second, quality as a determinant of inefficiency is analysed using a stochastic frontier approach (SFA) and the model of Battese and Coelli (1995). This methodology has the advantage of estimating the frontier function and inefficiency effects function in a single-stage sampling procedure, which allows efficiency to be estimated more accurately.

The rest of the paper is structured in the following way. The next section briefly reviews the literature on efficiency in the hotel industry. In section 3, the importance of quality as a determinant of efficiency is discussed theoretically and the working hypotheses are formulated. The research methodology is specified in section 4 and, subsequently, the data and the variables used are presented. The empirical results are given in section 6. Finally, the key findings and implications of the study are discussed.

2. Literature review

The concept and measurement of efficiency are very important in economics and have been analysed widely in practically all sectors. The hotel industry is no exception, and the literature on efficiency and productivity in this sector has developed greatly in the last decade, mainly due to the difficulties and challenges it has faced (Assaf & Magnini, 2012). This development has mainly followed two methodologies: Data Envelopment Analysis (DEA) and the Stochastic Frontier Approach (SFA).

DEA was first introduced by Charnes, Cooper, and Rhodes (1978). It is the most commonly used technique among the non-parametric and deterministic methods. The optimal frontier, which is obtained by linear programming methods, “envelops” inefficient companies. The distance between these companies and the optimal frontier is considered as inefficiency, though this method does not take into account possible random errors. This technique is used by authors such as Barros (2005); Hadad et al. (2012); Jorge and Suárez (2014); Fernández and Becerra (2015); Parte-Esteban and Alberca-Oliver (2015) and Wang et al. (2006a, 2006b), among others.

On the other hand, the SFA model is a parametric methodology, whereby a company is considered to be inefficient if it deviates from its optimal frontier. This model has the advantage, compared with DEA, of allowing decomposition of the error into a random part and an inefficient one. The SFA methodology has also been used by many authors to estimate efficiency in the hotel industry (Anderson, Fish, Xia, & Michello, 1999; Assaf & Magnini, 2012; Barros, 2004; Barros et al., 2010; Bernini & Guizzardi, 2010; Chen, 2007; Wang et al., 2007).

Virtually all these studies estimate cost efficiencies by specifying output variables like total revenue, sales, number of rooms, market share, guest numbers, nights stayed or some variants thereof. Only the study by Assaf and Magnini (2012) uses, in addition to others, customer satisfaction as an output to include the quality of hotel services. These authors found that the ranking of hotel efficiency changed depending on whether or not customer satisfaction was included as an output in the model.

In addition, authors like, Abrate, Capriello, and Fraquelli (2011); Becerra, Santaló, and Silva (2013); Israeli (2002); Núñez-Serrano, Turrión, and Velázquez (2014) and Orfila-Sintes, Crespí-Cladera, and Martínez-Ros (2005) suggest that the quality of hotels could be approximated by the hotel category (number of stars). In this regard, several studies use this variable as an explanatory factor for the possible differences between levels of cost (in)efficiency of hotels without reaching conclusive results. On the one hand, Assaf and Agbola (2011) and Such-Devesa and Mendieta-Peñalver (2013) state that the greater the number of stars, the greater the level of technical efficiency. These authors argue that the highest category hotels are technically more efficient because of the strong pressure to maintain their competitive position and their star ratings.

On the other hand, Tarim, Dener, and Tarim (2000) and Jorge and Suárez (2014) reach the opposite conclusion, arguing that hotels with the highest number of stars compete on differentiation and those with fewer stars on costs. While Oliveira, Pedro, and Marques (2013a) claim that this factor does not explain the levels of technical inefficiency in hotels in Portugal.

However, all these studies only estimate cost efficiencies, which, according to Berger and Mester (1997), do not adequately reflect the differences in the quality of output. Quality involves an extra cost; thus, a hotel that offers higher quality output could be considered to be more inefficient. As discussed in the previous section, higher quality output might be more expensive but not necessarily more inefficient (Maudos et al., 2002).

Only the study by Oliveira, Pedro, and Marques (2013b) analyses the effect that four and five stars have on the efficiency of hotel revenues in Portugal. Their results show that, although five-star hotels tend to achieve higher levels of revenue efficiency than four-star ones, the hotel category is not a significant determinant of that efficiency. These authors justify this tendency arguing that greater differentiation in services attracts customers with greater purchasing power.

To date, we know of no study that analyses how service quality affects the profit efficiency of hotels. Therefore, this paper aims to study the impact of quality on hotel efficiency, from the perspective of both costs and revenue and their interaction.

3. Quality as a determinant of efficiency and hypotheses

The concept of service quality has been widely discussed in the literature as a difficult concept to define and measure. “The evaluation of quality for services is more complex than for products because of their intrinsic nature of heterogeneity, inseparability of production and consumption, perishability and intangibility” (Akbaba, 2006, p. 171). Likewise, the measurement of quality can be understood from two different perspectives: first, an objective one, based on measurable characteristics and, second, a subjective perspective, taking into account customer satisfaction (Núñez-Serrano et al., 2014).