Analyzing hotel efficiency from a regional perspective: The role of environmental determinants

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ABSTRACT

With the development of the tourism industry over the last three decades, there has been growing interest in evaluating the efficiency of the hotel industry from a regional perspective. This paper joins this stream of research and assesses the performance of the Spanish hotel industry using a two-stage double bootstrap data envelopment analysis methodology. Additionally, we extend research on the impact of environmental variables on efficiency by examining the impact of four variables: length of stay, number of international tourists, destination quality, and the sun and sand tourism model. The results show a high degree of hotel inefficiency for Spanish regions and a significant effect of the environmental variables considered. These results give policymakers more accurate information for future strategic decisions, especially because that tourism constitutes a strategic sector of Spain's national economy.

1. Introduction

Tourism constitutes an important source of economic growth for many countries (Eurostat, 2017). The hotel industry is both a capital factor in such development and a source of research interest.

Over the last two decades, several studies have examined the efficiency of the hotel industry. These studies differ mainly in the sample used, the methodology applied, and their attempts to explain hotel efficiency by means of (different) specific determinants. For the sample, most previous studies focused on measuring efficiency by hotel (brand) and/or examined a reduced sample of hotels at a concrete (geographically limited) destination. In this context, the present paper follows the works of Porter (1998) and Crouch and Ritchie (1999) and relies on the interconnection that exists between the destinations (i.e., the specific geographical area in which the tourist spends some time) and the hospitality firms located in them (i.e., hotels). Governments and researchers are increasingly concerned about the efficiency not only of hotels but also of tourism destinations (Cracolici and Nijkamp, 2008; Gomezeljn and Mihalic, 2008). One of the elements that deserve more research attention is the destination performance at the regional hotel sector level. The main question is whether hotels operate efficiently, i.e., whether they use (scarce) resources in an efficient way. Despite the importance of destination performance, research on hotel efficiency at a regional level is limited (Barros et al., 2011; Benito et al., 2014; Botti et al., 2009; Brida et al., 2012; Detotto et al., 2014; Guccio et al., 2017; Huang et al., 2012; Pulina et al., 2010; Solana-Ibáñez et al., 2016).

Assaf et al. (2017) recently called for more research on specific destinations. Thus, the main focus of this study is to assess the efficiency of the hotel industry at a regional level.

The second research objective of this study is to examine the impact of different drivers on regional hotel efficiency. As noted by Assaf et al. (2012), most efficiency studies do not include environmental (contextual) variables. Very recent research by Assaf and his colleagues has highlighted the need for more research on the determinants of efficiency, such as destination characteristics (Assaf and Josiassen, 2016; Assaf et al., 2017). In this paper, we aim to extend this stream of research by examining the impact of four environmental variables that have not been used previously together to explain regional hotel efficiency. These include length of stay, number of international tourists (characteristics related to the market), destination quality and the sun and sand tourism model (characteristics related to the specific destination). We employ the two-stage double bootstrap data envelopment analysis (DEA) methodology proposed by Simar and Wilson (2007) to estimate regional hotel efficiency and to examine the effect of the proposed environmental variables on efficiency.

Finally, this research contributes to the literature by focusing on Spain, which is a leading country in the tourism sector. Given the huge competitiveness in the country and the rise of new international destinations, there is a clear need to better understand Spanish hotels' efficiency. This task requires better knowledge of the geographical diversity of Spain, as reflected by the different regions (also named autonomous communities) into which it is politically and

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administratively divided, which constitute the units of analysis of this research. Autonomous communities in Spain play a major role and have great independence from the central government in relation to many issues, including tourism planning (Ivars-Baidal, 2004). Thus, the quantification of possible hotel efficiency differences at a regional level and the identification of some relevant determinants of such differences are of great interest and relevance from a regional tourism policy perspective.

The rest of the paper is structured as follows. The next section reviews the study context and discusses the determinants of regional hotel efficiency. Section 3 presents the research methodology, the data and the variables used. Section 4 presents the empirical results, and Section 5 summarizes the key findings and discusses the implications.

2. Research framework

2.1. Efficiency in the hotel industry

In the context of the tourism sector, the importance of evaluating hotel efficiency has been widely supported. Using different techniques to estimate efficiency, it is possible to determine how effectively a hotel is using resources and to identify factors that are beyond managers' control (Reynolds, 2003). Thus, several studies have centered on examining hotel efficiency (see Assaf and Josiassen, 2016, for a recent review). These studies differ mainly in the type of inputs and outputs employed, the sample considered and/or the methodology applied.

Regarding the variables used, Barros and Dieke (2008) summarized the inputs and outputs traditionally included in hotel efficiency studies. Normally, the selection of variables is driven by the availability of information and researcher criteria. Ball et al. (1986) suggested that three broad categories of variables are essential: financial, physical and composite (reflecting financial and physical variables). Among the inputs, physical variables such as the number of employees (e.g., Anderson et al., 1999; Hwang and Chang, 2003) and the number of available rooms (Assaf et al., 2015a,b; Barros, 2005b; Johns et al., 1997) are usually employed. Furthermore, several authors have included financial variables, such as salaries paid (e.g., Barros, 2005a; De Jorge and Suárez, 2014; Morey and Dittman, 1995) and food and beverage costs (e.g., Anderson et al., 2000; Wang et al., 2007). Among the outputs, total revenues and sales are the most commonly employed variables (e.g., Anderson et al., 1999; Barros and Alves, 2004; Shang et al., 2008). In addition, new variables have been examined in recent years, such as customer satisfaction (e.g., Assaf and Magnini, 2012) and employee satisfaction, which, as Reynolds and Biel (2007) highlighted, complete a truly holistic and accurate productivity assessment.

As for the sample, most previous studies have focused on measuring efficiency by hotel (brand) and/or have examined a reduced sample of hotels in a concrete (geographically limited) destination. In this sense, most papers refer to the USA (e.g., Anderson et al., 1999; Brown and Ragsdale, 2002; Morey and Dittman, 1995), Asia (e.g., Hwang and Chang, 2003; Wang et al., 2007) or Western Europe (e.g., Portugal: Barros and Alves, 2004; Barros, 2005a; or Spain: De Jorge and Suárez, 2014).

The literature on hotel efficiency has also used various methods of analysis, with the most common being the non-parametric technique of DEA (e.g., Barros, 2005b; Johns et al., 1997; Tsaur, 2001) and a parametric stochastic frontier (Barros, 2004; Oliveira et al., 2013a,b; Weng and Wang, 2006). Recent works have developed more complex methods to examine hotel efficiency and to overcome some of the inherent limitations of previous approaches. For example, Assaf et al. (2012) proposed a metafrontier method to account for the environmental and technological differences in hotel efficiency, whereas other authors have utilized bootstrapping techniques (e.g., Assaf and Cvelbar, 2010; Yin et al., 2015).

Finally, although many papers have focused on estimating hotel efficiency (e.g., Barros, 2005b; Hwang and Chang, 2003; Morey and

Dittman, 1995), a more recent stream of research has gone further and tried to explain the efficiency results by means of different variables (e.g., Assaf and Josiassen, 2012; Assaf et al., 2012; Yang et al., 2017). In this sense, Assaf and Josiassen (2012) presented a list of the determinants that affect tourism performance, which include destination attractiveness (e.g., tourism resources), business environment (e.g., nearby retail malls), regional image and profile (e.g., environmental quality) and supportive factors (e.g., transportation facilities and internet services). Some studies have highlighted the importance of internal (endogenous) factors, such as corporate and management strategies (e.g., Hwang and Chang, 2016; Xiao et al., 2012). However, as noted recently by Assaf et al. (2015a,b) and Yang and Cai (2016), destination-related external (exogenous) factors are probably even more important determinants of hotel performance than internal ones are; nevertheless, the former have surprisingly been less studied.

To overcome this limitation, we aim to extend the research on the impact of environmental variables on hotel efficiency at a regional level.

2.2. Hotel efficiency at a regional level

Governments are increasingly concerned about the performance of tourism activities, given their huge economic and social impacts, although the number of studies on the hotel industry from a regional perspective is quite small (Barros et al., 2011). Following this stream of research, there have been recent attempts to examine hotel efficiency at a regional level in France, China, Italy and Spain (see Table 1).

The present study adds to this literature and examines to what extent hotels located in the different Spanish regions maximize the outputs from the inputs considered. Spain is one of the world's leading tourism markets and topped the 2017 edition of the Travel & Tourism Competitiveness Index (TTCI; World Economic Forum, 2017). Tourism is central to the Spanish economy, with the hotel sector being one of the main pillars. In fact, Spain is known as the most tourist-friendly country in the world, and its tourism service infrastructure is particularly sound, reaching second in the TTCI ranking in this regard (World Economic Forum, 2017). According to Eurostat (2017), Spain recorded the highest tourism gross value added, at 58% in the 16 countries for which data were available. The report also highlighted that the nights spent in tourist accommodations in Spain represented 15.1% of the EU-28 total (404 million nights). Although these figures are impressive and tourism constitutes a strategic sector of Spain's national economy, works focused on hotel efficiency in Spain are quite recent and limited in number (Arbelo-Pérez et al., 2017; Benito et al., 2014; De Jorge and Suárez, 2014; Fernández and Becerra, 2015; Parte-Esteban and Alberca-Oliver, 2015a,b; Pérez-Rodríguez and Acosta-González, 2007; Solana-Ibáñez et al., 2016). Within this context, the works of Benito et al. (2014) and Solana-Ibáñez et al. (2016) have been the only attempts to measure Spanish hotel efficiency on a regional basis.

This paper follows and aims to expand the stream of extant research on the impact of environmental variables on hotel efficiency at a regional level. As stated above, destination-related external (exogenous) factors are crucial determinants of hotel performance. Broadly speaking, destination-related variables that might determine efficiency can be classified as (i) market variables (e.g., number of tourist arrivals at the destination, length of stay and average spending of tourists) and (ii) destination characteristics (e.g., degree of competition in the area and tourist attractors). In the specific context of this study, the few works available present substantial differences in the choice of variables (see Table 1). Benito et al. (2014) and Solana-Ibáñez et al. (2016), which are the only studies to have analyzed Spanish regional hotel efficiency, both used destination characteristics. Their choice was based on a Spanish report, *Monitoring the Competitiveness of the Spanish Regions* (MoniTUR Report), and they selected only the tourism attractors they considered to strongly influence the competitiveness of Spanish regions. Barros et al. (2011) also employed tourism attractions, which are