

Effects of faith-based attributes on hotel prices: the case of halal services

Faith-based attributes on hotel prices

2839

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Abstract

Purpose – For more than 40 years, researchers have examined an exhaustive set of attributes as price determinants in tourism and hospitality. In extending this rich research stream, this study aims to propose and empirically assess a new set of hotel attributes, namely, faith-based attributes that allow tourists to continue following the activities and rituals guided by their religions while on vacation.

Design/methodology/approach – Using the Bayesian quantile regression for the first time in the field of hotel pricing, the hedonic pricing models examine both internal and external faith-based attributes, namely, halal services, which cater to the needs of Muslim tourists, in a sample of 805 hotels across the top three non-Muslim country destinations (Singapore, Thailand and Japan).

Findings – By exploring the effects of faith-based (halal) attributes available in hotels located in the biggest cities of the above-mentioned destinations, this study provides evidence for the significant role of faith-based (halal) attributes in determining hospitality prices.

Practical implications – This study's findings offer a resource for several implications for tourism and hospitality scholars, practitioners and policymakers, especially within the field of Muslim/halal tourism, to develop action plans and strategies.

Originality/value – This study is the first to introduce a novel set of faith-based hospitality attributes and empirically assess their impact on hospitality price formation. Additionally, it contributes to the hedonic pricing method by being the first to use the Bayesian quantile regression.

Keywords Hedonic price model, Bayesian quantile regression, Faith-based attributes, Hotel prices, Muslim/halal tourism

Paper type Research paper



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1. Introduction

Research on the determinants of hospitality prices has been a flourishing field of study for more than four decades ([Arbel and Pizam, 1977](#)), with both academic research and practitioners providing evidence on the significance, size and direction of the effects of these determinants. Within this field of study, prices are assumed to reflect consumer preferences for attributes and services embedded in hospitality offerings such as room size, sea view, availability of bars, restaurants, swimming pools, spas, geographic location of the facility, hotel reputation and seasonality ([Papatheodorou et al., 2012](#)).

Despite mounting evidence on the effect of this exhaustive set of attributes and services on hospitality prices, extant hospitality pricing research has not explored the effect of a more discreet, albeit important, set of attributes for many customers, namely, faith-based attributes, on hospitality prices. However, tourism and hospitality research has already indicated the influences of different religions on tourists' preferences, choices and behaviors ([Oktadiana et al., 2016](#); [Ryan, 2016](#); [Terzidou et al., 2018](#)). However, hitherto, no empirical study within hospitality pricing research has suggested a coherent set of faith-based hospitality attributes nor has one quantified the effect of such attributes and services on the formation of hospitality prices.

This study seeks both to provide a coherent set of faith-based attributes and capture their effects on hospitality prices. To accomplish this, it focuses on tourists who follow the Muslim religion. Muslim tourists are a fast-growing market, rising to 260 million in 2016 from 25 million in 2000, with an annual online travel expenditure expected to reach US \$300bn by 2026 ([Boğan et al., 2020](#); [El-Gohary, 2016](#); [Mastercard-CrescentRating, 2019a, 2019b](#)). While different sub-segments of Muslim tourists have distinct needs and expectations from tourism and hospitality service providers, their religion creates a common set of faith-related needs and expectations that significantly influence their preferences and choices in tourism and hospitality ([Battour and Ismail, 2016](#); [Eid and El-Gohary, 2015a, 2015b](#); [Jafari and Scott, 2014](#); [Ryan, 2016](#); [Vargas-Sánchez and Moral-Moral, 2019a](#)). More specifically, the Islamic faith calls for adherence to specific religious practices such as performing five daily prayers, consuming food and beverages that do not contain swine or alcohol, using segregated facilities, etc., which, in turn, compose the distinctive needs of Muslim travelers ([Henderson, 2016a](#); [Mastercard-CrescentRating, 2019c](#)).

Despite the burgeoning volume of Muslim tourists and the importance of this group of tourists in following specific religious obligations while traveling away from their countries, academic research in tourism and hospitality has not explored whether and how the religious needs of Muslim tourists affect the formation of prices in tourism and hospitality ([Hall and Prayag, 2019](#); [Rasul, 2019](#); [Vargas-Sánchez and Moral-Moral, 2019](#)). To this end, this study seeks to make several contributions. First, it introduces a novel set of faith-based hospitality attributes and empirically assesses their impact on the formation of hospitality prices. Second, given the empirical context of Muslim tourists in need of halal-friendly services, this study offers critical insights into the needs and expectations of this rapidly increasing group of international tourists to a number of tourism and hospitality providers across non-Muslim countries. Given non-Muslim countries' increasing interest in attracting Muslim tourists ([Han et al., 2019](#); [Henderson, 2016b](#); [Mastercard-CrescentRating, 2017](#)), this study examines the effect of faith-based services on hotel prices in the top three non-Muslim country destinations for Muslim travelers, namely, Singapore, Thailand and Japan. Finally, this study seeks to contribute to the hedonic pricing theory by applying frequentist and Bayesian quantile regression (QR) for the first time in the field of hotel pricing ([Li, 2015](#)).

The remainder of this paper is structured as follows: Section 2 starts by offering a brief review of hedonic pricing literature within the hospitality and draws from religious tourism

literature, more specifically, halal tourism research, to demonstrate the role of halal service attributes for Muslim tourists. Section 3 outlines the research design and analytical approach. Section 4 presents the study results. Section 5 compares and contrasts the results with those from recent empirical research on hospitality hedonic pricing and halal tourism, presents theoretical and practical implications and finally lays down the study limitations along with suggestions for future research.

2. Literature review

2.1 Hedonic pricing in hospitality

Hedonic pricing has been extensively used by hospitality scholars to capture the effect of a very large set of attributes on the prices of hospitality services. Most of these attributes can be organized into three groups: hotel facilities, including all physical, technical and technological aspects of the hotel, as well as the services available within its properties (Alegre *et al.*, 2012; Espinet *et al.*, 2003; Thrane, 2005), hotel reputation, which refers to the certification of hotels on the basis of stars but may also include customer reviews and the reception of awards (Kim *et al.*, 2020; Santos *et al.*, 2015; Yang *et al.*, 2016) and hotel location, including geographic location, urban/rural regions, physical surroundings and distance from manmade or natural points of interest (Abrate *et al.*, 2019; Espinet *et al.*, 2012; Latinopoulos, 2018).

An important gap in hospitality hedonic pricing literature is that, with a couple of exceptions, there are no empirical studies that systematically examine any combinations of hotel facility, reputation and location attribute that address the needs and expectations of a particular group of customers such as customers with disabilities, business customers, customers with special interests (e.g. sports, explorations and culture – Herrmann and Herrmann, 2014), customers belonging to specific ethnic groups (Alegre *et al.*, 2013) or customers with specific religious preferences. This study represents an initial attempt to close this gap in hospitality hedonic pricing literature by exploring a specific combination of hotel facility, reputation and location attributes, namely, faith-based attributes, which aim to cater to the needs and expectations of customers whose religious beliefs dictate a set of behaviors that need to be integrated into their everyday activities, including lodging for leisure or business purposes.

2.2 Religious and halal tourism

As indicated by numerous literature reviews, religious tourism, defined as “the visit of local, regional, national and international religious centers” (Rinschede, 1992, p. 52), has been gaining an increasing interest among academic scholars over the past four decades (Collins-Kreiner, 2020; Kim *et al.*, 2021).

Halal tourism (also termed Muslim-friendly or halal-friendly tourism) is one of the most dynamically developing types of religious tourism (Collins-Kreiner, 2020). According to Ryan (2016, p. 121), halal tourism “is tourism undertaken for recreational, leisure and social purposes” by members of the Islamic faith. The word *halal* is Arabic and means “allowable,” “acceptable” and “permissible.” In tourism, practitioners and scholars use two different terms to describe Muslim-oriented tourism: “Islamic tourism” and “halal tourism.” The main difference between the two terms is that Islamic tourism mainly refers to travel activities pertaining to religious and pilgrimage purposes, while halal tourism pertains to leisure and recreational activities but is always driven by Islamic faith (Battour and Ismail, 2016; Ryan, 2016). Hence, halal tourism focuses on tourists from all around the world attending Islam, who must adhere to Shariah law as a result of their religious beliefs.

Halal tourism has sparked a vivid research interest over the past decade (Hall and Prayag, 2019; Rasul, 2019; Vargas-Sánchez and Moral-Moral, 2019). Within halal tourism research, the most sizable sub-stream of inquiry has been directed toward assessing the effects of an extensive set of halal-related attributes, available either at a macro-level (i.e. destinations) or micro-level (i.e. hotels), on several attitudinal outcomes of Muslim tourists (e.g. satisfaction, destination image, purchase intentions, revisit intentions, word-of-mouth, etc.) (Vargas-Sánchez and Moral-Moral, 2019). In one of the earliest studies on halal tourism, Battour *et al.* (2011) sought to gauge descriptions of halal attributes available in hotels deemed important by Muslim respondents in Malaysia. Authors organized the identified attributes into two groups, namely, “tangible” (e.g. halal food and prayer facilities: easy access to a mosque/prayer room, Quran and Qiblah direction pointer, Muslim toilets) and “intangible” (e.g. Islamic entertainment: men’s and women’s segregated swimming pools, Islamic morality: no public demonstration of affection in couples and Islamic call (Azan) for prayer).

Han *et al.* (2019) found that an extended set of halal attributes across several aspects of a tourism destination (i.e. social environment, facilities, food and beverage, locals and staff, services) significantly affect destination image and revisit and recommendation intentions of Muslim tourists visiting a non-Muslim destination (Korea).

Moving from the destination (macro) level of analysis to the hotel (micro) level of analysis, Eid and El-Gohary (2015b) demonstrate that Islamic physical attributes (i.e. prayer facilities, halal food, copy of Holy Quran, Shariah-compatible toilets) significantly and strongly affect Muslim customer satisfaction with the hotel. However, Islamic non-physical attributes (i.e. segregated service, Shariah-compatible television channels, Shariah-compatible entertainment tools and art that does not depict human forms) have a significant effect on customer satisfaction with the hotel only for the more religious Muslim hotel customers.

Moreover, in a study of Muslim tourists staying at halal-friendly hotels in Thailand, Jeaheng *et al.* (2020) found that while “halal-friendly services and staff” and “halal-friendly facilities and physical environment” have a significant effect on Muslim tourist satisfaction, the effect of “halal foods and beverages” on satisfaction was non-significant. Furthermore, Papastathopoulos *et al.* (2020) supported Eid and El-Gohary’s (2015b) research by demonstrating that, within a hotel context, both Islamic physical and non-physical attributes significantly affect Muslim customers’ purchase and revisit intentions.

Despite significant progress in our knowledge of the role of halal attributes in Muslim tourists’ attitudes, there is no empirical evidence on the extent to which such attitudes are associated with actual patronage behaviors (Ajzen and Fishbein, 1977). That is, there is no empirical evidence on the extent to which Muslim tourists who suggest that they are satisfied with the availability of halal-friendly tangible and intangible attributes in tourism destinations and hotels (Eid and El-Gohary, 2015b; Jeaheng *et al.*, 2020) are willing to pay to have access to such attributes (Papastathopoulos *et al.*, 2020) and are actually paying the prices associated with the availability of such services in tourism destinations and hotels.

Another limitation of halal tourism research relates to the absence of empirical evidence on the effect of each individual halal-friendly attribute on Muslim tourists’ attitudinal responses. While the effort to develop measurement scales for capturing the effects of halal-friendly attributes on Muslims tourists has been both productive and rigorous (Al-Ansi *et al.*, 2020; Eid and El-Gohary, 2015b; Han *et al.*, 2019), the effects of halal-related attributes identified by these studies on the attitudinal outcomes of Muslim tourists are assessed as a group (i.e. first-order or even second-order latent factors such as “worship facilities,”

“Halalness,” “Islamic morality,” “alcohol- and gambling-free zones” and “Islamic non/physical attributes,”) rather than as individual items.

This study is the first attempt to fill these gaps by exploring the effect of several individual halal-related attributes on hotel room prices. On the one hand, hotel room prices are formulated by the availability of certain attributes in the hotel rooms and hotels that they belong to, as well as the geographic and social environment the hotels operate in. On the other hand, hotel room prices are formulated by the importance customers assign to these attributes by actually paying to receive these attributes (Lancaster, 1966; Rosen, 1974). While the room prices we collected across our large sample of hotels during data collection constitute the actual prices paid by both Muslim and non-Muslim customers to these hotels, according to the hedonic pricing approach (Lancaster, 1966; Rosen, 1974), the significant effects of individual halal-related attributes on these prices represent observed behavioral evidence of the important Muslim tourists assign to each of these individual halal-related attributes.

3. Research methodology

3.1 Sample selection

To assess the effect of faith-based attributes available at hotels on tourists' preferences and choices, the current study focuses on Muslim tourists in an empirical context. In addition to the importance of faith-based activities in the daily lives of this group of tourists, which provides us with a discrete set of faith-based attributes and services available at hotels (Battour *et al.*, 2011; Eid and El-Gohary, 2015a), our choice of Muslim tourists as the empirical context of our study is motivated by the rapidly increasing importance of this group of tourists in the international tourism industry (CrescentRating Playbook, 2020; Mastercard-CrescentRating, 2020).

Given that halal attributes are always available in hotels across Muslim countries, an amenity that is expected by Muslim tourists visiting Muslim countries, we anticipate that the effect of halal attributes available at hotels in Muslim countries is less pronounced on Muslim tourists' preferences and choices for hotels in Muslim countries. Hence, we decided to focus our data collection on hotels across several non-Muslim countries because halal attributes are far less frequently available when compared to hotels in Muslim countries. Thus, we expect to be able to record a more nuanced picture of the effect of halal attributes available at hotels in non-Muslim countries on Muslim tourists' preferences and choices for these hotels.

Since 2011, Mastercard and CrescentRating have been analyzing the Muslim travel market and benchmarking destinations based on their “services,” “environment,” “ease of communication” and “ease of access to the destination” (MasterCard-CrescentRating, 2018). The assessment of these four clusters involves quantitative measurements across many halal-friendly criteria and sub-criteria to compile the final score per country; 130 countries from five continents have been ranked in the Global Muslim Travel Index (GMTI) since 2015. According to the latest GMTI report (Mastercard-CrescentRating, 2019a), the top three non-Muslim country destinations for Muslim tourists are Singapore, Thailand and Japan. As such, we use these top three non-Muslim country destinations to select our hotel sample.

As the sample is derived from different countries, only the leading cities were considered to maintain travel homogeneity within the samples. According to the “Top 100 City Destination Ranking Report,” the leading cities for each of our selected countries are Singapore City for Singapore; Bangkok, Phuket, Pattaya and Chiang Mai for Thailand; and Tokyo, Osaka and Kyoto for Japan (Euromonitor International, 2018). An initial sample of 970 hotels was extracted from these cities in the three non-Muslim countries (Singapore: 201;

Thailand: 554; Japan: 215), but due to missing values, the sample was reduced to 805 hotels (Singapore: 186; *Singapore city*: 186, Thailand: 435, *Bangkok*: 127, *Phuket*: 112, *Pattaya*: 108, *Chiang Mai*: 88, Japan: 184, *Tokyo*: 84, *Osaka*: 4 and *Kyoto* 53).

To ensure consistency in the data mining process, we follow previous studies in the field of hedonic pricing in hotels (Latinopoulos, 2018) and used a single source (tripfez.com – English version) to extract our data. This is also because other well-known databases such as TripAdvisor and Booking do not systematically record halal-related services. As such, the information was obtained from the tripfez.com website, which specializes in halal services provided by hotels that are of direct interest to Muslim travelers. More specifically, we extracted all the data for hotels that offered at least one halal-friendly service and were listed on tripfez.com. Similar approaches for specialized services have also been adopted in other hedonic pricing studies (Cró *et al.*, 2019; Falk, 2008; Herrmann and Herrmann, 2014).

3.2 Variables and data sources

3.2.1 *Dependent variables.* Given the strong correlation between hotel prices and seasonality (Espinete *et al.*, 2012; Wang *et al.*, 2019), the standard double room rate was calculated during the peak period in each country (Sánchez-Pérez *et al.*, 2019; Soler *et al.*, 2019a). A common peak period was selected for all three countries to avoid possible seasonal effects (Wang *et al.*, 2019) and demand variations (Latinopoulos, 2018) in terms of international tourist arrivals and average hotel occupancy rates. As shown in Figure 1, November and December can be considered a common peak period for Singapore, Thailand and Japan in accordance with international tourists' arrivals and the average hotel occupancy rate in 2018. Thus, data collection occurred on November 18–20, 2019, to capture tourism seasonality and identify room prices under similar demand, as suggested by previous studies (Latinopoulos, 2018; Wang *et al.*, 2019). Finally, room prices were collected for two different one-week stays – the last week in November and the first week of December 2019 for each country.

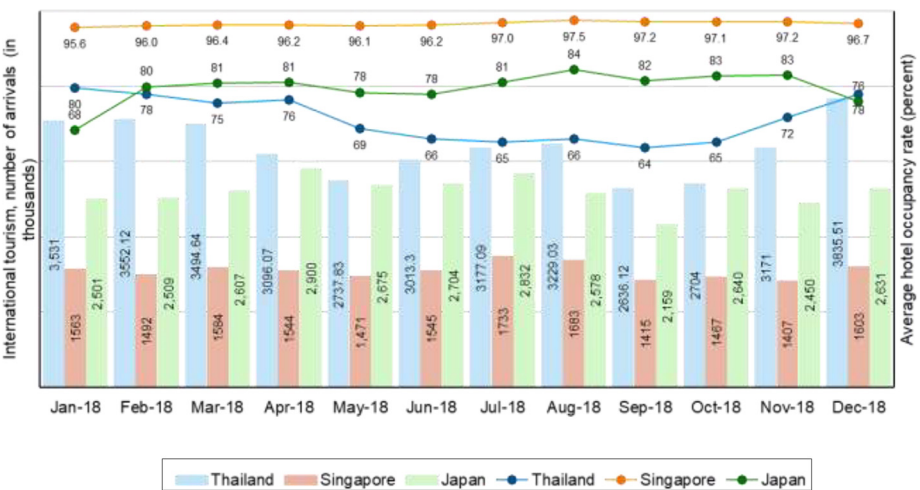


Figure 1.
International tourists' arrivals and the average hotel occupancy rate for each month in 2018 (color should be used)

Sources: The data were obtained from the Japan National Tourism Organization (2019), Singapore Tourism Analytics Network (2019), Singapore Open Data Licence version 1.0 (2018), Bank of Thailand (2018) and CEIC (2019)

3.2.2 Independent variables. We categorize the independent variables into two categories, *internal faith-based attributes (IFA)* and *external faith-based attributes (EFA)*, following similar categorizations already adopted across hedonic pricing studies within hospitality (Hung *et al.*, 2010; Sánchez-Pérez *et al.*, 2019; Tang *et al.*, 2019; Wang and Nicolau, 2017; Wang *et al.*, 2019), as well as empirically validated categorizations of halal attributes in extant halal tourism research (Al-Ansi *et al.*, 2020; Battour *et al.*, 2014; Eid and El-Gohary, 2015b; Han *et al.*, 2019). IFA consists of those faith-related services and facilities available by hotels (e.g. prayer room, availability of halal food, etc.). EFA consists of aspects outside and not related to any hotel specifically, including physical, as well as broader sociopolitical aspects that may impact hotel room prices. For this study, we derived our EFA from the Mastercard-CrescentRating GMTI (2019a) because it is the only source that systematically records aspects from the external hotel environment of importance to Muslim tourists that might affect hotel room prices, including Muslim travelers' safety and security (i.e. no Islamophobia) level per country, hotel distance from the nearest mosque and the availability of halal restaurants near the hotel. The walking distance between the hotel and mosque, if any, was computed using Google Maps, while the level of safety for Muslim travelers (Islamophobic sentiments) per country was extracted from the GMTI (Mastercard-CrescentRating, 2019a).

3.2.3 Control and reputational variables. In addition to IFA and EFA, three establishment/control variables (ECV) and one reputational (REP) were also included to avoid omitted variable bias (Abbott and Klainer, 2011). Consistent with prior studies, we used *hotel size* (i.e. number of rooms per hotel, Becerra *et al.*, 2013; Hua and Yang, 2017; Kim *et al.*, 2020), *hotel category* (i.e. number of stars, from 2 to 5, with the category "2 stars" as a reference, Masiero *et al.*, 2015; Sánchez-Pérez *et al.*, 2019; Soler *et al.*, 2019b) and *distance* from the city center (Pawlicz and Napierala, 2017; Schamel, 2012; Soler *et al.*, 2019b; Soler and Gemar, 2018) as ECVs. Moreover, given the strong effect of reputation on hotel room prices (Sánchez-Pérez *et al.*, 2019; Soler *et al.*, 2019a), we control for the Guest Experience Index (GEI) instead of customer online reviews available in single online travel agencies (OTAs) (e.g. Booking, TripAdvisor) for the first time in hedonic pricing literature. The GEI algorithm developed by Olery in collaboration with Vrije University Amsterdam indicates that guests' overall perceptions of hotel quality using data do not form a single OTA but stem from 31 review sites and travel agencies. Important factors such as the integrity of the review site, reviewer and relative age of the review, were taken into account when calculating the GEI and weighing the score (Olery, 2019). Table 1 provides a brief description of all the variables and their descriptive statistics.

3.3 Analytical approach

To examine which faith-based attributes and services available at the hotels of our sample influenced room prices, a semi-logarithmic model was formulated according to the following standard linear formulation:

$$LNPrice = \alpha + C_i\beta_1 + ECV_i\beta_2 + IFA_i\beta_3 + EFA_i\beta_4 + REP_i\beta_5 + \varepsilon_i$$

where α denotes the constant term, C_i represents the countries, ECV_i represents the establishment/control variables, IFA_i is the internal faith-based attribute, EFA_i is the external faith-based attribute, REP_i is the reputational variable and ε_i is the error.

However, the linear regression (LR) analysis provides the conditional mean estimates, which display an incomplete picture of the dependent variable's distribution because it cannot capture the coefficients of the independent variables for the entire regression (Mosteller and Tukey, 1977; Santos and Vieira, 2012). Previous studies have shown that the

Table 1.
Descriptive statistics
and description of
the variables

Variables	Mean	SD	Description
<i>Dependent variable</i>			
Average price	4.414	0.760	The logarithm of the average room price in two different one-week stays (measured in US\$) Room prices (not logarithmic values): Min = 12\$, Max = 1416\$
<i>Independent variables</i>			
<i>Countries</i>			
Singapore	0.230	0.421	The research covers the top three travel destinations for Muslim tourists in non-Muslim countries (Singapore; used as the reference category and dummy variables for Thailand and Japan)
Thailand	0.542	0.499	
Japan	0.228	0.420	
<i>Establishment/control variables</i>			
ECV_Hotel Stars: 2*	0.158	0.365	Hotel categories from two to five stars (Masiero <i>et al.</i> , 2015). No available data for one star (by three dummy variables with the two stars category used as the reference)
ECV_Hotel Stars: 3*	0.479	0.500	
ECV_Hotel Stars: 4*	0.257	0.437	
ECV_Hotel Stars: 5*	0.106	0.308	
ECV_Hotel Size	4.567	1.147	The natural log of the number of rooms per hotel (Sánchez-Pérez <i>et al.</i> , 2019)
ECV_Location	0.766	0.424	Number of rooms (not logarithmic values): Min = 5; Max = 3560
<i>Internal/faith-based attributes</i>			
IFA_Halal Food	0.270	0.444	Whether the hotel is located in the city center or not (ref. city center) (Pawlikz and Napierala, 2017) (dummy variable)
IFA_Halal Certification	0.020	0.140	Availability of halal food in the hotel (ref. no) (dummy variable)
IFA_Alcohol Free	0.994	0.079	Availability of halal certificate in the hotel (ref. no) (dummy variable)
IFA_Praying Mat	0.122	0.328	Whether the hotel does not provide alcohol in the room (ref. no) (dummy variable)
IFA_Qibla Sticker	0.455	0.498	Availability of prayer mat in the hotel (ref. no) (dummy variable)
IFA_Water-friendly Washrooms	0.293	0.455	Placement of Qibla stickers (direction point toward Makkah city) in the hotel room (ref. no) (dummy variable)
IFA_Private Pool	0.005	0.070	Availability of hand showers, bidets or Japanese-style toilets (ref. no) (dummy variable)
<i>External/faith-based attributes</i>			
EFA_Halal Restaurants	0.196	0.397	Availability of private pool in the hotel (ref. no) (dummy variable)
EFA_No Islamophobia	87.646	7.307	Availability of halal restaurant nearby the hotel (ref. no) (dummy variable)
EFA_Mosque	-1.533	1.122	Muslim travelers' safety and security (no Islamophobia) level per country on a scale from 1 to 100 (Mastercard-CrescentRating, 2019a). Min = 80; Max = 97
<i>Reputational attributes</i>			
REP_GEI	87.301	8.108	The logarithm of the distance from the nearest mosque
			Distance in Km (not logarithmic values): Min = 0.01; Max = 11.6
			Guest experience index weighted score on a scale from 1 to 100 (Olerý, 2019)
			Min = 53.30; Max = 94.63

use of LR for heavy-tailed distributions and asymmetric variables is not advisable because it may lead to erroneous estimates (Howell Smith *et al.*, 2020; Koenker and Bassett, 1978; Marrocu *et al.*, 2015; Sánchez-Pérez *et al.*, 2019; Wang *et al.*, 2019). In light of these limitations, we checked whether the LR model assumptions were fulfilled.

First, we tested the potential effects of multicollinearity using the variance inflation factor (VIF). All values ranged from 1.03 to 2.13, which was below the threshold of 10; therefore, multicollinearity was ruled out (Hair *et al.*, 2019). The Shapiro-Wilk test, which is recommended for asymmetric distributions (Yap and Sim, 2011), indicates a departure from normality ($W = 0.980$, $p < 0.001$). Additionally, the Breusch-Pagan test confirmed the absence of homoscedasticity ($\chi^2(15) = 50.630$, $p < 0.001$).

Finally, we investigated the potential for endogeneity by using instrumental variable techniques. Several hospitality researchers have adopted instrumental variable techniques (Park *et al.*, 2020; Sánchez-Pérez *et al.*, 2019; Santos and Vieira, 2012). We reviewed previous studies with the aim of finding instruments that fulfill two important conditions, namely, relevance (i.e. correlation with the regressor) and exogeneity (i.e. uncorrelated with the error term) (Kennedy, 2008, p. 141). Based on these two criteria, we selected the age of the hotel (Diéguez-Soto *et al.*, 2017; Sánchez-Pérez *et al.*, 2019), free Wi-Fi and multilingual staff (Kim *et al.*, 2017) to serve as instruments for reputation (GEI) on the predictors of hotel prices. As suggested by Semadeni (2014), a three-step approach was adopted. First, we assess the strength of the association between the instrumental variables and regressor (using an F-statistic). We then examine the potential endogeneity of instruments (using the Sargan test). Finally, we test for endogeneity issues in the effect of the instrumental variables on the reputational variable (using the Hausman test). The first set of instrument variables, which were the *age of the hotel* and *free Wi-Fi*, revealed no influence of endogeneity on the GEI [$F(2,743) = 36.5473$, $p < 0.001$, Sargan $\chi^2(1) = 1.089$, $p = 0.297$ and Hausman $F(1,743) = 2.018$, $p = 0.156$]. Similarly, the second set of instrument variables, which were the *age of the hotel*, *free Wi-Fi* and *multilingual staff*, also revealed no influence of endogeneity on GEI [$F(3,742) = 24.390$, $p < 0.001$, Sargan $\chi^2(1) = 1.893$, $p = 0.388$ and Hausman $F(1,743) = 2.362$, $p = 0.125$].

The violation of LR assumptions, along with the heavy-tailed distribution of the dependent variable with positive skewness and kurtosis values of 4.981 and 32.624, respectively, led to the conclusion that the conditional mean analysis will provide an incomplete picture of the conditional distributions (Mosteller and Tukey, 1977), affecting the final causal relationships (Aguinis and Edwards, 2014). Frequentist QR is an alternate approach that is powerful in locating the diverse effects of independent variables on the conditional distribution of the outcome variable (Davino *et al.*, 2014; Koenker and Hallock, 2001; Santos and Vieira, 2012). Moreover, the nonparametric nature of QR makes it less sensitive to outliers and non-normal error terms (Davino *et al.*, 2014; Koenker and Bassett, 1978; Li, 2015).

Despite the advantages of frequentist QR over LR, like the other frequentist approaches, it does not provide any distribution information of parameters at each quantile; hence, it is impossible for researchers “to know what the effect size or credible intervals are (Li, 2015, p. 75).” To overcome the aforementioned limitations, the Bayesian QR technique also complements the two previous frequentist methods (LR and QR). The use of Bayesian QR moves beyond the frequentist LR and QR analyzes by determining the effect size, evaluating the acceptance of the null hypothesis (Li, 2015) and “providing more efficient estimation due to the borrowing of information between neighboring quantiles” (Dortet-Bernadet *et al.*, 2020, p. 23). Therefore, in response to Assaf and Tsionas (2018) and Li (2015), who call for moving beyond the conventional regression methods, the current study uses a Bayesian QR

analysis in addition to frequentist LR and QR analyzes. More specifically, to estimate the percentage impact of the dummy coded variables on a log-dependent variable, we transformed the coefficient by using the base of the natural logarithm $(e^{\beta} - 1) * 100$. For the continuous variables, we multiplied the coefficient by 100 (Halvorsen and Palmquist, 1980; Jan van Garderen and Shah, 2002). Frequentist LR and QR analyzes were performed in STATA 16.1, while the Bayesian QR was obtained using the “bayesQR” package in R (Benoit and Van den Poel, 2017).

4. Model results

Table 2 reports the coefficients estimated by linear and simultaneous frequentist QR, while Table 3 presents the Bayes estimates or posterior means at the 10th, 25th, 50th, 75th and 90th quantiles. The 10th and 25th quantiles can be considered as indicative of the very low- and low-priced hotel rooms, 50th quantile as indicative of the mid-priced hotel rooms and 75th and 90th quantiles represent the high- and very high-priced hotel rooms. The goodness of fit was assessed by pseudo R^2 and standard errors were calculated using the bootstrap method (Davino *et al.*, 2014; Koenker and Machado, 1999).

A careful look at Tables 2 and 3 and Figure 2 indicates many differences among LR, frequentist and Bayesian QR estimators, particularly from the non-Gaussian distribution of room prices. The results from the three regression methods confirm that internal and external faith-based attributes, along with reputational attributes, are important determinants of room prices. Moreover, differences were detected between the countries and hotel stars. Regarding the country variables, the results show that Thailand has higher prices than Japan, although the coefficients are not statistically significant for all quantiles.

Guest experience and hotel stars have positive and significant coefficients for all LR, frequentist and Bayesian QR. When it comes to the hotel's location (out of the city center) and hotel size (number of rooms), the LR shows that both negatively affect room prices, with the frequentist and Bayesian QR providing a more nuanced picture. More specifically, both frequentist and Bayesian QR analyzes revealed that hotel size does not affect room prices for low-priced rooms (q10 and q25), but it negatively affects room prices for mid-priced (q50) and high- and very high-priced rooms (q75 and q90). Interestingly, the LR shows that the price for hotels located outside the city center decreases by 13.4%, yet the frequentist and Bayesian QR tell a different story. Both methods revealed no effect of the hotel's location for all quantiles except in the high- and very high-priced rooms (q75 and q90), leading to a price decrease of 14.5% and 24.1%, respectively, for hotels located outside of the city center.

Regarding internal faith-based attributes, for “halal food,” LR, frequentist and Bayesian QR, analyzes showed significant and positive coefficients for all quantiles (except q10th for QR) [Figure 2(a)], with LR suggesting an increase in the price of 13.8%. Bayesian QR provides a more nuanced picture of the increases across all quantiles (q10 = 9.8%, q25 = 15.2%, q50 = 11.5%, q75 = 13.3%, q90 = 20.8%). Inequality tests suggest no significant differences in price increases across all five quantiles (Table 4). Interestingly, while the LR shows that “halal certification” has no effect on room prices, frequentist and Bayesian QR revealed a different story [Figure 2(b)] because both suggest positive and significant effects of “halal certification” in the high- and very high-priced rooms (q75 and q90). According to Bayesian QR semi-elasticity, prices rise by 38.4% and 46.1% for high- and very high-priced rooms, respectively (inequality tests suggest that there are significant differences between very low- and low-priced (q10 and q25) and high- and very high-priced (q75 and q90) rooms in “halal certificate”; Table 4).

Regarding the availability of a “prayer mat,” the results from LR are consistent with the frequentist and Bayesian QR [Figure 2(c)], with significant and positive effects throughout

Variables	LR	Frequentist QR: quantiles				
		Q10	Q25	Q50	Q75	Q90
<i>Countries</i>						
Thailand	9.895** (4.906)	6.466 (5.642)	8.200* (4.201)	5.694 (4.052)	12.164*** (3.396)	19.155*** (2.514)
Japan	2.289** (0.921)	1.555 (1.026)	1.897** (0.789)	1.484* (0.761)	2.802*** (0.642)	4.103*** (0.474)
<i>Establishment/control variables</i>						
ECV_Hotel Stars: 3	0.355*** (0.052)	0.300*** (0.070)	0.356*** (0.060)	0.385*** (0.054)	0.390*** (0.088)	0.356*** (0.094)
ECV_Hotel Stars: 4	0.852*** (0.065)	0.770*** (0.096)	0.855*** (0.068)	0.894*** (0.065)	0.929*** (0.110)	0.797*** (0.106)
ECV_Hotel Stars: 5	1.518*** (0.081)	1.370*** (0.107)	1.382*** (0.086)	1.543*** (0.094)	1.553*** (0.131)	1.496*** (0.196)
ECV_Hotel Size	−0.069*** (0.018)	−0.014 (0.031)	−0.027 (0.022)	−0.076*** (0.022)	−0.108*** (0.026)	−0.119*** (0.035)
ECV_Location	−0.144*** (0.046)	−0.098 (0.074)	−0.029 (0.059)	−0.082 (0.061)	−0.148 (0.093)	−0.245* (0.138)
<i>Internal faith-based attributes</i>						
IFA_Halal Food	0.129*** (0.040)	0.071 (0.065)	0.145*** (0.046)	0.112** (0.049)	0.153** (0.076)	0.210*** (0.081)
IFA_Halal Certification	0.070 (0.123)	−0.317 (0.286)	−0.051 (0.189)	0.245 (0.267)	0.328* (0.263)	0.470* (0.268)
IFA_Alcohol Free	−0.107 (0.195)	−0.013 (0.275)	−0.083 (0.257)	−0.118 (0.212)	−0.115 (0.168)	0.026 (0.169)
IFA_Prayer Mat	0.150*** (0.061)	0.137*** (0.067)	0.121** (0.057)	0.166*** (0.063)	0.124* (0.069)	0.170* (0.100)
IFA_Qibla Sticker	0.106** (0.041)	0.126* (0.064)	0.110** (0.046)	0.102* (0.058)	0.096 (0.066)	0.087 (0.074)
IFA_Water-friendly Washrooms	0.094*** (0.037)	−0.044 (0.064)	0.099** (0.043)	0.114** (0.051)	0.100 (0.063)	0.216*** (0.094)
IFA_Private Pool	1.218*** (0.224)	1.036* (0.608)	1.884*** (0.648)	1.505*** (0.483)	1.421*** (0.368)	0.953*** (0.348)
<i>External faith-based attributes</i>						
EFA_Halal Restaurant	0.054 (0.043)	0.119** (0.055)	0.044 (0.052)	0.036 (0.042)	0.079 (0.055)	0.063 (0.069)
EFA_No Islamophobia	0.653** (0.306)	0.445 (0.341)	0.550** (0.262)	0.390* (0.253)	0.793*** (0.212)	1.230*** (0.157)
EFA_Mosque	−0.063*** (0.023)	−0.072* (0.040)	−0.067* (0.036)	−0.064** (0.028)	−0.079* (0.051)	−0.021 (0.052)
<i>Reputational attributes</i>						
REP_GEI	0.018*** (0.002)	0.016*** (0.003)	0.017*** (0.003)	0.016*** (0.004)	0.019*** (0.004)	0.016*** (0.004)
Constant	−60.397*** (29.728)	−40.704 (33.190)	−50.797*** (25.444)	−34.778 (24.540)	−73.721*** (20.549)	−115.593*** (15.186)
<i>n</i>	786	786	786	786	786	786
<i>R</i> ²	0.689	0.475	0.474	0.464	0.459	0.459
F _{stat} , H ₀ : β _i = 0	94.21***	47.40***	76.10***	75.07***	41.54***	26.34***

Notes: Standard errors are bootstrapped with 1,000 replications and shown in brackets; **p* < 0.10; ***p* < 0.05; ****p* < 0.01. The Wald test (F-statistic) and Pseudo *R*² were used to assess the goodness of fit for the models (Davino *et al.*, 2014; Koenker and Machado, 1999). The results indicate that the full model is significant in all quantiles

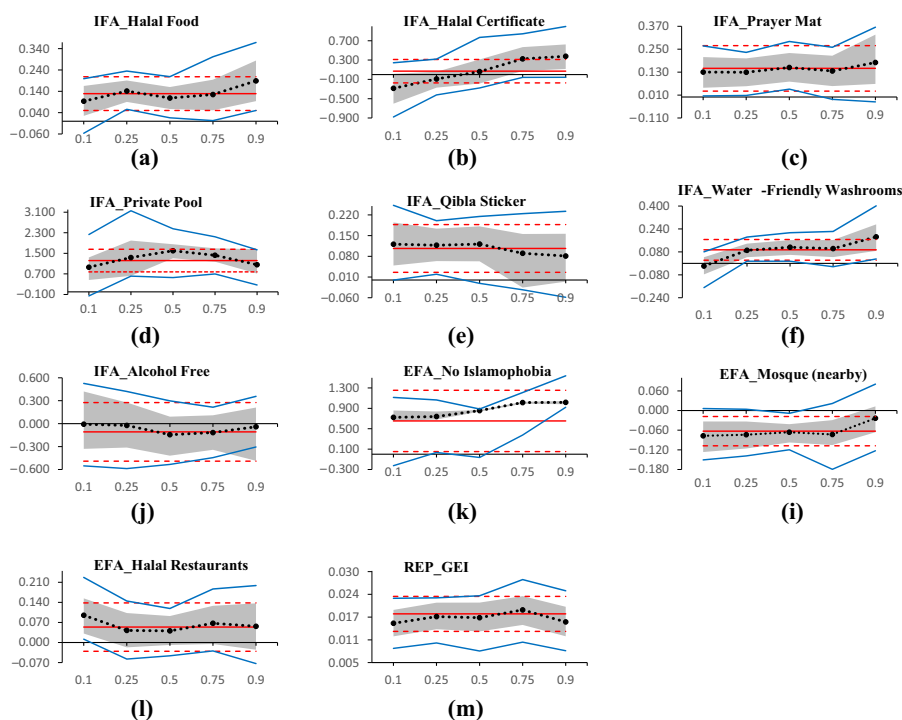
Notes: Standard errors are bootstrapped with 1,000 replications and shown in brackets, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The Wald test (F-statistic) and Pseudo R^2 were used to assess the goodness of fit for the models (Davino *et al.*, 2014; Koenker and Machado, 1999). The results indicate that the full model is significant in all quantiles

Table 2.
LR and QR
regression
coefficients

Table 3.
Bayesian QR
estimated beta and
credible intervals

Variables	Q10			Q25			Q50			Q75			Q90		
	Bayes	LCI	UCI	Bayes	LCI	UCI	Bayes	LCI	UCI	Bayes	LCI	UCI	Bayes	LCI	UCI
Thailand	1.63	-1.48	4.73	1.18	-1.56	4.19	1.83	-1.40	4.92	0.95	0.29	4.18	0.49	0.07	3.70
Japan	0.66	0.07	1.26	0.58	0.06	1.14	0.75	0.14	1.35	0.69	0.07	1.29	0.61	0.01	1.23
ECV_Hotel Stars: 3	0.33	0.25	0.42	0.35	0.28	0.42	0.37	0.30	0.42	0.36	0.27	0.45	0.33	0.21	0.43
ECV_Hotel Stars: 4	0.81	0.69	0.93	0.84	0.75	0.92	0.87	0.80	0.95	0.89	0.77	0.99	0.77	0.65	0.90
ECV_Hotel Stars: 5	1.41	1.26	1.54	1.37	1.26	1.47	1.52	1.43	1.62	1.52	1.38	1.65	1.53	1.34	1.74
ECV_Hotel Size	-0.02	-0.05	0.01	-0.03	-0.05	0.00	-0.07	-0.10	-0.05	-0.10	-0.12	-0.07	-0.10	-0.14	-0.06
ECV_Location	-0.07	-0.15	0.02	-0.04	-0.11	0.02	-0.06	-0.13	0.00	-0.16	-0.25	-0.07	-0.28	-0.40	-0.16
IFA_Halal Food	0.09	0.03	0.17	0.14	0.09	0.19	0.11	0.06	0.16	0.12	0.05	0.19	0.19	0.09	0.28
IFA_Halal Cert	-0.29	-0.60	0.02	-0.09	-0.27	0.06	0.06	-0.19	0.31	0.33	0.07	0.57	0.38	0.12	0.62
IFA_No Alcohol	-0.01	-0.33	0.42	-0.02	-0.31	0.28	-0.14	-0.42	0.09	-0.12	-0.34	0.11	-0.04	-0.49	0.21
IFA_Prayer Mat	0.13	0.05	0.21	0.13	0.06	0.20	0.15	0.08	0.23	0.14	0.06	0.22	0.18	0.07	0.33
IFA_Qibla	0.12	0.05	0.19	0.12	0.06	0.17	0.12	0.06	0.18	0.09	-0.03	0.16	0.08	-0.01	0.16
IFA_Water Washrooms	-0.02	-0.08	0.04	0.09	0.04	0.14	0.11	0.06	0.16	0.10	0.04	0.16	0.18	0.09	0.27
IFA_Private Pool	0.96	0.46	1.34	1.33	0.62	2.00	1.60	1.31	1.85	1.42	1.17	1.69	1.06	0.71	1.66
EFA_Halal Restau	0.10	0.03	0.15	0.04	-0.02	0.10	0.04	-0.01	0.09	0.07	-0.01	0.13	0.06	-0.03	0.14
EFA_Islamophobia	0.72	0.65	0.86	0.74	0.68	0.84	0.86	0.84	0.87	1.01	0.99	1.03	1.02	0.98	1.04
EFA_Mosque	-0.08	-0.13	-0.03	-0.07	-0.12	-0.03	-0.07	-0.10	-0.04	-0.07	-0.11	-0.03	-0.02	-0.07	0.01
REP_GEI	0.02	0.01	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.01	0.02
Constant	-11.52	-30.19	7.31	-8.38	-26.59	8.37	-11.48	-30.09	8.13	-5.72	-25.32	13.84	-2.20	-21.66	17.60

Notes: Bayes: Bayes estimate or posterior mean; LCI: lower credible interval: 0.025; UCI: upper credible interval: 0.975; non-informative prior distributions; MCMC iterations = 5,000 (Benoit and Van den Poel, 2017; Dortet-Bernadet *et al.*, 2020)



Notes: The shaded area denotes the Bayesian QR credible interval (lower credible bound: 0.025; upper credible bound: 0.975) and the black dotted line is the estimated beta per quantile. The horizontal red line shows the LR results and the two dashed red lines indicate the 95% confidence interval. Blue lines denote the upper and lower 95% confidence interval of frequentist QR and the area, respectively

Figure 2.
LM, frequentist and
Bayesian QR
estimates for
attributes by quantile
(color should be used)

the price distribution (Bayesian QR semi-elasticities: $q_{10} = 13.9\%$, $q_{25} = 13.8\%$, $q_{50} = 16.7\%$, $q_{75} = 14.6\%$ and $q_{90} = 19.8\%$). The “availability of private pool” demonstrates the largest significant effect in relation to all other internal and external halal attributes in the study [Bayesian QR semi-elasticities: $q_{10} = 160.9\%$, $q_{25} = 279.7\%$, $q_{50} = 395.3\%$, $q_{75} = 315.6\%$ and $q_{90} = 187.7\%$; inequality tests suggest no significant differences in price increases across all five quantiles; Table 4 and Figure 2(d)].

Regarding the “Qibla sticker,” the LR analysis shows a positive and significant effect on room prices equal to 11.2%, but the parameters obtained by frequentist and Bayesian QR revealed a significant impact only at the first three quantiles [Figure 2(e)] (Bayesian QR semi-elasticities: $q_{10} = 12.9\%$, $q_{25} = 12.5\%$ and $q_{50} = 12.9\%$). Regarding a “water-friendly washroom,” the LR analysis suggests a positive and significant effect on room prices equal to 9.9%, with the Bayesian QR suggesting that this effect holds true at all levels of room prices except for the lowest one, whereby the effect of this attribute was non-significant [Figure 2(f)] (Bayesian QR semi-elasticities: $q_{25} = 9.5\%$, $q_{50} = 11.9\%$, $q_{75} = 10.9\%$ and $q_{90} = 20.3\%$; inequality tests suggest significant differences in price increases between all price quantiles and q_{10} ; Table 4). Finally, all three techniques resulted in a non-significant effect of “no provision of alcohol in the room” on room prices across all price levels [Tables 2 and 3 and Figure 2(g)].

Table 4.
Testing the
constancy of
coefficients among
quantiles (Wald test)

Variables	Q10 = Q25	Q10 = Q50	Q10 = Q75	Q10 = Q90	Q25 = Q50	Q25 = Q75	Q25 = Q90	Q50 = Q75	Q50 = Q90	Q75 = Q90
Thailand	0.460	0.030	1.210	5.580**	0.530	0.920	6.810***	4.070**	13.210***	8.350***
Japan	0.500	0.010	1.640	6.310**	0.420	1.360	7.750***	4.760**	14.080***	8.010***
ECV_Hotel Stars: 3	0.660	1.230	0.730	0.230	0.240	0.140	0.000	0.000	0.090	0.120
ECV_Hotel Stars: 4	0.980	1.460	1.310	0.040	0.300	0.390	0.220	0.130	0.780	1.390
ECV_Hotel Stars: 5	0.010	1.970	1.310	0.340	3.210*	1.570	0.320	0.010	0.060	0.100
ECV_Hotel Size	0.250	3.750*	6.600**	5.580**	4.820**	7.650***	5.780**	1.750	1.410	0.110
ECV_Location	1.070	0.040	0.220	0.960	0.860	1.550	2.370	0.620	1.410	0.660
IFA_Halal Food	1.710	0.390	0.760	1.870	0.540	0.010	0.570	0.420	1.420	0.520
IFA_Halal Cert	1.110	2.950*	3.190*	4.390**	1.670	1.950	3.080*	0.110	0.540	0.100
IFA_No Alcohol	0.100	0.170	0.130	0.020	0.030	0.020	0.160	0.000	0.420	0.810
IFA_Prayer Mat	0.060	0.150	0.020	0.080	0.610	0.000	0.210	0.380	0.000	0.240
IFA_Qibla	0.080	0.110	0.130	0.180	0.020	0.040	0.080	0.010	0.030	0.010
IFA_Water Washrooms	6.170**	5.640**	3.150*	5.780**	0.120	0.000	1.500	0.080	1.230	2.040
IFA_Private Pool	2.640	0.550	0.370	0.020	0.420	0.530	1.990	0.050	1.520	2.610
EFA_Halal Restau	2.240	2.120	0.340	0.450	0.030	0.310	0.060	0.790	0.130	0.060
EFA_Islamophobia	0.430	0.040	0.040	1.160	5.480**	0.560	0.880	4.050**	13.170***	8.360***
EFA_Mosque	0.010	0.700	0.010	0.700	0.010	0.050	0.660	0.100	0.720	1.300
REP_GEI	0.060	0.000	0.490	0.020	0.060	0.360	0.000	0.850	0.020	0.470
Constant	0.420	0.050	1.110	5.310**	0.600	0.840	6.510**	4.030**	12.990***	8.190***

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Moving to external faith-based attributes “Muslim travelers’ safety and security (no Islamophobia)” have the strongest effect on room prices compared to all other external attributes examined in this study. The LR results demonstrate that a safe environment without Islamophobic sentiment leads to an increase in prices of 92.1%, with both frequentist and Bayesian QR depicting [Figure 2(h)] an increasing effect of this external attribute from lower to higher price quartiles (Bayesian QR semi-elasticities: $q_{10} = 106\%$, $q_{25} = 109.6\%$, $q_{50} = 135.4\%$, $q_{75} = 175.5\%$ and $q_{90} = 176.7\%$).

All three analytical approaches result in negative and significant coefficients for the “distance from the nearest mosque” [Figure 2(i)], with LR indicating that room prices drop by 6.1% as their distance from the nearest mosque increases by 1%; frequentist and Bayesian QR confirm this result, with the exception of the highest price quartile (q_{90}), whereby the effect is non-significant (Bayesian QR semi-elasticities: $q_{10} = 7.4\%$, $q_{25} = 7.1\%$, $q_{50} = 6.4\%$ and $q_{75} = 7\%$). Finally, the LR analysis shows no statistically significant effect of “availability of halal restaurants near the hotel,” while frequentist and Bayesian QR showed a significant positive impact only for the lowest-priced quantile (Bayesian QR semi-elasticity: $q_{10} = 10\%$) [Figure 2(j)].

5. Discussion and implications

5.1 Conclusions

Recent academic research on halal tourism (Papastathopoulos *et al.*, 2020) demonstrates that Muslim tourists are willing to pay more for the availability of a number of internal and external halal-related attributes. Using observed behavioral data (i.e. actual room prices), our study confirms these findings and offers additional validity to a number of typologies of halal attributes (Al-Ansi *et al.*, 2020; Eid and El-Gohary, 2015b; Han *et al.*, 2019). Moreover, our results complement the findings of previous studies (Battour *et al.*, 2014; Han *et al.*, 2019), suggesting that the presence of halal-friendly hospitality services in a tourism destination positively affects Muslim tourists’ satisfaction with the destination.

Our results also demonstrate that the availability of “halal food” in the hotel and a “prayer mat” in the room both have a significant and positive effect across all room price levels, which corroborates findings from the extant halal academic research on the positive effects of “Halalness” (Battour *et al.*, 2014) and “Islamic physical attributes” (Eid and El-Gohary, 2015b) on a number of Muslim tourists outcomes (e.g. satisfaction, destination evaluation, willingness to purchase, etc.). Likewise, our results demonstrate that the availability of a “swimming pool” for Muslim women has a consistently positive effect on room prices across all price levels, which could be attributed to the importance Shariah law is placing on the presence of women in public spaces, especially during times of leisure and relaxation (Battour and Ismail, 2016; El-Gohary, 2016; Mastercard-CrescentRating, 2019b). This significant effect should be attributed to the fact that making a separate swimming pool available only to Muslim women, in addition to the main hotel swimming pool, requires a very high financial outflow that hotels can only recover by substantially increasing prices across all room price levels (Samori and Sabtu, 2014).

On the other hand, study results suggest that “halal certification” significantly affects the price of only high-priced rooms. Indeed, receiving halal certification requires serious investments in infrastructure, personnel training and processes, resulting in high costs (Henderson, 2016b; Samori and Sabtu, 2014). Hotels can only recover and sustain in the long run by charging higher prices and are more likely to be afforded by Muslims at higher rather than mid and lower socioeconomic strata. Given that all rooms in our sample include bathrooms, where Muslim tourists can wash their hands/feet, may explain the significant but, relatively to other halal attributes, the low effect of a “water-friendly washroom” on the hotel premises across all room price levels, with the lowest room price level actually becoming entirely non-significant. Unsurprisingly, the effect of “no provision of alcohol in

the room” was not significant across all room-price levels because hotels do not incur an expense for removing alcoholic beverages from mini-bars in rooms booked by Muslim tourists, which is what customers also believe, as the results of our study suggest.

Based on the effects of attributes associated with the external (e.g. manmade, sociopolitical, etc.) hotel environment, our results confirm expectations of the catalytic role of Islamophobia in Muslim tourists’ behavior (Stephenson, 2014; Stephenson and Ali, 2010), with “Muslim travelers’ safety and security (no Islamophobia)” having the strongest effect among all external halal attributes and across all room price levels. Our results, in principle, coincide with the results of attitudinal studies demonstrating the importance Muslim tourists ascribe to the availability of mosques near their hotels (Battour *et al.*, 2011; Rodrigo and Turnbull, 2019). Albeit, the impact of “distance from the nearest mosque” is relatively small across all room price levels, while it becomes non-significant in the highest room price level. A possible explanation for this may be that during leisure trips, Muslims are allowed to perform their daily prayers anywhere as long as this is a clean space and no mosque is nearby (El-Gohary, 2016; Jafari and Scott, 2014; Mastercard-CrescentRating, 2019b). Finally, “availability of halal restaurants near the hotel” does not have a significant effect across all room price levels except the lowest price level, which can be explained by the fact that a significant number of hotels in our sample have restaurants that offer halal food. However, many hotels in our sample in the lowest room price level have dining areas with limited food options that rarely include halal food.

Although not the focus of the current study, the effects of the hotel’s reputational attributes align with numerous studies on hedonic pricing within tourism and hospitality (Chica-Olmo *et al.*, 2020; Espinet *et al.*, 2012; de Oliveira Santos, 2016; Yang *et al.*, 2016), which suggests that hotel stars and guest experience significantly affect prices across all room price levels. Finally, in accordance with many hedonic pricing studies (Alegre *et al.*, 2013; Baldassin *et al.*, 2017; Pawlicz and Napierala, 2017), our results indicate the importance of the hotel’s location relative to the city’s center. Interestingly, the negative effect of hotel location becomes significant only in the case of more expensive rooms. A plausible explanation for this may be that on leisure trips, Muslim tourists from higher socioeconomic strata enjoy visiting luxury products and services retailers (i.e. apparel, jewelry, restaurants) (Mohamed *et al.*, 2020; Prayag and Hosany, 2014), which are typically located in city centers rather than in city outskirts.

5.2 Theoretical implications

Research efforts to identify the determinants of hospitality pricing span over four decades (Arbel and Pizam, 1977). These determinants include an exhaustive set of internal and external factors for hospitality facility attributes and services (Papatheodorou *et al.*, 2012). Despite the breadth and depth of determinants, extant hospitality pricing research has not recognized the effects of faith-based attributes, that is, the internal and external attributes of a hospitality facility aimed at addressing the needs (i.e. habits and rituals) derived from the religions their customers follow. This study is the first to pinpoint the critical role that faith-based attributes may have on the formation of hospitality prices and offer empirical evidence on an extensive set of internal and external faith-based attributes for Muslim tourists. More specifically, this study assesses the effects of a specific set of hotel attributes (faith-based/halal, e.g. halal food, prayer mat, distance from a mosque, etc.) that cater to the needs of a specific customer segment (i.e. Muslim tourists) rather than the effect of hotel attributes (e.g. room size, room amenities, view of the room, swimming pool, distance from airports, etc.) that cater to the needs of a much broader customer base.

Furthermore, this study enriched nascent Muslim/halal tourism research by providing evidence that is based on observed behavioral data rather than unobserved attitudinal data (i.e. prices actually paid versus willingness to pay). It also provides an assessment of the effect of individual halal attributes rather than their cumulative (reflective) factorial variables.

Finally, by using the Bayesian QR for the first time in hedonic pricing literature within tourism and hospitality, the current study offers a more nuanced understanding of the effects of halal attributes on customer behaviors. Although frequentist QR enables researchers to overcome the pitfalls of skewed distributions and unfold the relationships between variables alongside the entire distribution of the outcome variable (Koenker *et al.*, 2017; Uribe and Guillen, 2020), it does not provide any distribution information of parameters at each quantile (Li, 2015). Thus, Bayesian QR “allows researchers to make direct probability statements about the parameters” (Assaf and Tsionas, 2018, p. 141) and “generate distributions for specific regression coefficients (Li, 2015, p. 92).”

In our study, the Bayesian QR helped us obtain a complete regression picture for room pricing. For instance, the LR analysis showed that “halal certification” has no effect on room prices, while the Bayesian QR revealed that there is a significant effect for the 75th and 90th quantiles. The Bayesian QR analysis constitutes a sound statistical tool for detecting relationships that traditional estimation techniques cannot. This study showed that the Bayesian estimation has practical advantages over the frequentist analysis, alongside those that advocate the use of Bayesian methods in management studies (Al-Sabri *et al.*, 2019; Assaf and Tsionas, 2018; Kruschke *et al.*, 2012; Li, 2015; Papastathopoulos *et al.*, 2020; Zyphur and Oswald, 2013).

5.3 Practical implications

The findings of this study offer a resource for several managerial implications. First, hotel managers should pay attention to halal food, which exercises a constant positive effect throughout the price distribution but also halal certification for the products and services being offered. Considering that the halal certification has a significantly strong effect at higher price quantiles, hotel managers can explore the potential for increasing the prices of their more expensive rooms to fund halal certification in their hotels.

Second, the effect of prayer-related attributes shows that a “Qibla sticker” in the room is linked to a decrease in room prices, implying that for mid- and low-priced hotels, the availability of the Qibla sticker could create a more marginal affect on room rates. In contrast, the availability of prayer mats in hotels is larger in mid- and high-priced hotels than in low-priced hotels, revealing that higher revenue can be generated by this faith-based service from high-priced hotels.

Third, the impact of “water-friendly washrooms” displays a positive upward trend; hence, the availability of Japanese-style toilets or hand showers is associated with higher premiums for all hotels. Fourth, “private pool” exercises a very strong impact on room rates across all price levels. Given the importance of segregated private facilities for Muslim tourists, hotel managers can set considerably higher prices than those of their competitors without private pools. Correspondingly, mid-priced hotel managers can create an important source of differentiation with a significant impact on profitability and reputation.

Looking at the EFAs, meaningful and practical implications can also be extracted. First, the empirical findings show a large effect of “Muslim travelers’ safety and security (no Islamophobia)” on hotel rates, which makes sense if the rise in Islamophobic sentiments around the world is taken into account (SETA, 2019). Therefore, security and safety have become a primary concern for Muslim tourists (Mastercard-CrescentRating, 2019b). As such, policymakers could develop action plans and strategies to increase public awareness of the benefits of halal tourism at the local and national levels. Local authorities and Muslim communities must be among the protagonists of this initiative. Other initiatives such as the development of information campaigns with the participation of famous Muslim actors, athletes or scientists sharing their view of the Muslim lifestyle, could play a central role in promoting and encouraging halal tourism. Furthermore, accessibility to mosques results in

a higher premium and leads to the conclusion that attracting and catering to Muslim tourists should build on joint efforts among practitioners and policymakers to build the capacity and increase the capability to seize the opportunity for halal tourism.

5.4 Limitations and future research

As the first study to introduce and empirically assess the role of faith-based attributes in hotel pricing, this study has a number of limitations that future research could address. First, the current study explored faith-based attributes derived from a single religion, Islam. Different religions such as Christianity, Hinduism and Buddhism dictate a different set of habits and rituals to the daily lives of the people following them, which, in turn, create needs and expectations for different sets of hospitality attributes and services by tourists following different religions. Identifying and empirically assessing the role of such attributes and services on hotel prices for tourists following different religions would further reveal the extent to which faith-based attributes affect hotel prices. It would also offer important guidance to hotel managers regarding the degree to which such attributes affect the preferences, choices, satisfaction and repatronage of their customers from different religions.

Relatedly, the data collection design of the current study did not allow us to capture the likely variation in the centrality of religiosity (Huber and Huber, 2012) for Muslim tourists, which is the extent to which Islam and its doctrines are more or less important and salient to the lives and personalities of Muslim tourists. It is likely that such variations moderate the strength of the effect we observed in the current study, which is an interesting question that future research could address. Finally, future studies can consider the use of informative priors, which could contribute to our understanding of faith-based attributes.

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