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## Hedonic Price Analysis of Hotel Rooms in Cyprus

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### ABSTRACT

The aim of the current study is to investigate which attributes or characteristics have significant effects on the hotel room prices in Cyprus. The author follows a hedonic price analysis approach and employs a data set consisting of 92 hotels, collected from a private tourist agent. The empirical findings indicate that hotel star rating, spa facilities, playgrounds, table tennis activities and proximity to a bus station all have significant effects on the hotel room prices, in both the summer and the winter seasons. Contrary, air-conditioning, direct-dial telephone and the presence of tennis court and indoor pool amenities affect the room rates only in the summer, while existence of a radio in the room has a significant effect on its pricing only in the winter. What is particularly noteworthy, given the empirical findings of existing studies, is that in Cyprus there seems to be an adverse effect from certain attributes (e.g., proximity to a public transportation hub) to the room rates, during both summer and winter.

**Keywords:** hedonic price analysis, hotel room rates, price determinants, Cyprus

### 1. Introduction

Hedonic price analysis (HPA) considers goods and services as bundles of characteristics that consumers are either willing to make extra payments for or they can actually do without (Monty & Skidmore, 2003). This type of analysis has been applied to many markets for differentiated products, such as vegetables (Waugh, 1928), automobiles (Griliches, 1961) and housing units (Wolverton & Senteza, 2000). The applications of the hedonic pricing model to the tourism industry include the analysis of airfare (Lei & Papatheodorou, 2010), ski lift tickets (Falk, 2008) and package tours (Espinet et al., 2003). However, the focus of the HPA research in travel and tourism has always been the analysis of hotel accommodation pricing (Portolan, 2013).

Pricing is a strategic choice for the hospitality sector enterprises. Not only does it generate enough

income for the hotel units to remain in the market, but it is also a powerful tool in terms of communication, negotiation, and competitiveness (Papatheodorou et al., 2012). However, there are many factors affecting room rates, thus making pricing decisions in the hotel industry a very complicated process. Therefore, it is essential, especially from a managerial perspective, to have a basic understanding of critical price determinants, such as the attributes of a hotel room which consumers appreciate the most (Chen & Rothschild, 2010). Since the hedonic pricing model renders the identification of the attributes which consumers appreciate the most an easier process (Falk, 2008), then information derived from such analysis may be useful in terms of strategic pricing within the travel and tourism industries (Thrane, 2007).

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The current paper investigates the impact that various characteristics have on the hotel room rates in Cyprus, a country where the tourism sector accounts for a substantial percentage of its national income.<sup>1</sup> The only other existing study examining the Cypriot hotel industry using a hedonic price analysis approach (Mitsis, 2021) circumvents the issue of seasonality by using a sample restricted to a single month. The current study addresses this issue by using data collected in both the summer and the winter season. The author hopes in that manner to have a significant contribution to the scholarly literature on the travel, leisure, and tourism sectors of Cyprus, and also to provide a better understanding of issues of interest to practitioners in the specific country and elsewhere.

The rest of this paper is organized as follows. Section 2 provides the literature review, while section 3 describes the data set used. Section 4 provides the methodological framework, section 5 presents the estimation results and concluding remarks are provided in section 6.

## 2. Literature Review

The hedonic pricing model has its origins in Lancaster (1966), according to which all goods and services are essentially bundles of characteristics that can be accurately assessed by the consumers (Schwieterman, 1995). The hedonic pricing method is formally established by Rosen (1974), where conventional microeconomic theory is used in order to derive the prices which consumers attribute to all of those characteristics. HPA has been applied ever since to many fields related to the pricing of products, such as computer industry (Chow, 1967), real estate (Goodman, 1978) and agriculture (Espinosa & Goodwin, 1991).

Possible determinants of the hotel room rates include the type of room, amenities provided by the hotel and attributes of the external environment, such as proximity to a specific landmark and outside views (Papatheodorou et al., 2012). Monty and Skidmore (2003) identify location, accommodation-specific attributes, and seasonality as being of particular interest, while Thrane (2007), stresses the

significance of service quality and the hotel star rating (among other attributes). As noted in Espinet et al. (2003), the rich variety of these factors, which Chen and Rothschild (2010) generally classify as internal and external, complicate the analysis of hotel room prices at a very high degree. In addition, there is a considerable variation regarding the hotel characteristics selected from study to study to examine their impact on the hotel room rates, despite that the existing literature (see, e.g., Andersson, 2000) provides specific guidelines to be followed in their selection.

The studies analyzing the determinants of hotel room prices in specific countries include Israeli (2002), Andersson (2010) and Hung et al. (2010), who examine the hotel rates in Israel, Singapore, and Thailand, respectively. Studies applying the hedonic pricing model for hotels in the Mediterranean region (i.e., the touristic territory where Cyprus is traditionally designated to) include Papatheodorou (2002), Pashardes et al. (2002) and Haroutunian et al. (2005). The empirical findings of Papatheodorou (2002) and Pashardes et al. (2002) both suggest that the hotel rooms in Cyprus are more expensive than in other Mediterranean destinations, something that cannot be fully attributed to the quality characteristics of the Cypriot hotels. Mitsis (2021), the only other existing study applying HPA to the Cypriot hospitality sector, identifies the hotel star rating and the existence of spa facilities as being among the attributes that potentially determine the whole hotel product, without however investigating the effect that seasonality may have on these outcomes.

## 3. Data

Most hotels in Cyprus are advertised in more than one tourist agency and, given the manner at which the travel and tourism markets operate, the price catalogs of different agencies tend to record the same information, more or less. For this reason, the author decides to utilize the catalog of a single tourist agency (*Top Kinisis Travel Plc*) in the estimations. The database derived from the catalog consists of 92 Cypriot hotels located in the six districts of the island

<sup>1</sup> According to the official website of the Statistical Service of Cyprus, the revenue from tourism in 2019 accounted for the equivalent of 12% of the nominal Gross Domestic Product (GDP) of the country.

(Famagusta, Larnaca, Limassol, Nicosia, Paphos, and Troodos) offering, as a total, more than 15,000 rooms.<sup>2</sup> For each hotel, data on the size (number of rooms), star rating, room rates and more characteristics (such as location, amenities and leisure activities offered) are collected.

Room rates tend to fluctuate, sometimes dramatically, and these fluctuations occur at different places and different times of the year (White & Mulligan, 2002). Most of the hotels in the sample have different prices per week, with the summer months being associated with higher room rates as compared to those observed in the months of the winter season. In order to control for this seasonality effect, the research period of the current study is limited to the months with the highest tourist activity in both summer and winter seasons of the year examined.

The decision of which months should be considered as the “peak season” in each case is based on calculations on data obtained from the Statistical Service of Cyprus, with March being chosen as the high season month of the winter period and July comprising the peak of the summer season.<sup>3</sup> A representative room price is then designated to both winter and summer seasons, using the average rates

calculated from the observed weekly prices offered in the months of March and July, respectively.

In order to avoid issues related with seasonality, the winter and the summer room rates are analyzed separately. The two data sets do not have the same number of observations, since some of the hotels in the sample were open for business in March 2017 but not in July 2017, and vice versa.<sup>4</sup> Eventually, the winter sample included prices for 65 hotels and 10,642 rooms, while the summer data included prices for 91 hotels and 15,548 rooms (see Table 1).

In order to make the observations as comparable as possible, only the price for accommodation in the cheapest room in the hotel is recorded in each case. For the same reason (i.e., to make sure that all observations in the data set are comparable), the current study focuses exclusively on hotels, despite the fact that the information obtained from the private travel agency included data on both hotels and hotel apartments. Therefore, the establishments contained in the data set are quite comparable, which is what Haroutunian et al. (2005) stipulate as a necessary condition for any hedonic analysis to be performed. The final sample is mostly consisted of hotels with an official rating of three or four stars, covering all six tourist districts in the island (see Table 2).

**Table 1.** *Distribution of Hotels and Rooms by Region for March and July 2017*

Territory	Number of Hotels		Number of Rooms	
	March 2017	July 2017	March 2017	July 2017
Famagusta District	3	16	507	2,975
Larnaca District	14	14	1,611	1,644
Limassol District	16	19	3,088	3,582
Nicosia District	9	9	848	848
Paphos District	20	29	4,379	6,136
Troodos Area	3	4	209	363
<b>Total</b>	<b>65</b>	<b>91</b>	<b>10,642</b>	<b>15,548</b>

<sup>2</sup> The sample size may seem small compared to other studies performing this type of research, but the scale of the Cypriot economy renders it quite representative. The total number of hotels registered in the Republic of Cyprus (in the government-controlled areas) is 258, as of 2020, distributed as follows: 88 in the district of Famagusta, 32 in the Larnaca district, 33 in the district of Limassol, 17 in the Nicosia district, 62 in the district of Paphos and 26 in the Troodos area (Deputy Ministry of Tourism, 2021).

<sup>3</sup> In Cyprus, the “summer tourist season” is usually defined as the period from April to October and the “winter tourist season” is considered to include the months November to March. In the current study, a month is designated as the “high season” if, as calculated from the data of the Statistical Service, it is the month with the highest number of tourist arrivals for most of the years in the period of consideration (2001–2020). The calculations indicate July as the month with the most arrivals in 17 out of the 20 summer seasons considered, and March as the month with the most arrivals in the winter season, accounting for the most arrivals in 14 out of the 20 years considered.

<sup>4</sup> Since the current study concerns a comparison of rooms of hotels with different attributes (including the category of the hotel), hotels that do not have a star rating at all are not relevant and are excluded from the final sample. Of the 92 hotels included in the sample, 64 had rooms available in both summer and winter seasons, 27 of them offered rooms only in the summer season and 1 was only available in winter.

**Table 2.** *Distribution of Hotels by Region in the Winter and Summer Periods*

Winter Period	Stars				Total
	2	3	4	5	
Famagusta District	0	0	1	2	<b>3</b>
Larnaca District	2	4	6	1	<b>14</b>
Limassol District	1	2	9	4	<b>16</b>
Nicosia District	2	5	1	1	<b>9</b>
Paphos District	0	4	10	6	<b>20</b>
Troodos Area	2	0	1	0	<b>3</b>
<b>Total</b>	<b>7</b>	<b>15</b>	<b>28</b>	<b>14</b>	<b>65</b>
Summer Period	Stars				Total
	2	3	4	5	
Famagusta District	0	5	7	4	<b>16</b>
Larnaca District	1	5	6	1	<b>14</b>
Limassol District	1	4	9	5	<b>19</b>
Nicosia District	2	5	1	1	<b>9</b>
Paphos District	0	7	13	9	<b>29</b>
Troodos Area	2	1	1	0	<b>4</b>
<b>Total</b>	<b>6</b>	<b>27</b>	<b>37</b>	<b>20</b>	<b>91</b>

**Source.** Author's calculations from data contained in the catalogs of a private tourist agency.

In line with the theoretical guidelines for selecting independent variables in hedonic price theory (Andersson, 2000) the variables' selection is based on the previous studies (for example, Israeli, 2002; Espinet et al., 2003; Haroutunian et al., 2005; Thrane, 2005; Pawlicz & Napierala, 2016; and Wang et al., 2019), utilizing the information contained in the travel agent's catalog. The resulting variable list is too large for any manageable statistical model. In order to circumvent the problem of multicollinearity that is usually present in hedonic price analysis (see, for example, Yalçin & Mert, 2018; and Mitsis, 2021), stepwise regressions are then carried out to limit the number of regressors to a manageable level.<sup>5</sup>

Table 3 presents the characteristics and attributes selected in the current study to examine their effect on the hotel room price. These variables consist of information derived from the travel agent's catalog. In some instances, more information is obtained through inquiries to the Deputy Ministry of Tourism

**Table 3.** *Data Set Description*

Variable	Explanation	Mean	Std. Dev.
Price	The logarithm of the price of the hotel room (in €)	3.999	0.432
Location	The district where the hotel is located:		
Famagusta	The hotel is situated in the district of Famagusta	0.122	0.328
Larnaca	The hotel is situated in the district of Larnaca	0.179	0.385
Limassol	The hotel is situated in the district of Limassol	0.224	0.419
Nicosia	The hotel is situated in the district of Nicosia	0.115	0.321
Paphos	The hotel is situated in the district of Paphos	0.314	0.466
Troodos	The hotel is situated in the Troodos area	0.045	0.208
Star Rating	The official star rating of the hotel (1 to 5)	3.779	0.887
Air Condition	The hotel room is air-conditioned	0.558	0.498
Radio	The hotel room amenities include a radio	0.360	0.481
Telephone	The hotel room has a direct dial-telephone	0.558	0.498
Indoor Pool	The hotel amenities include an indoor pool	0.212	0.410
Playground	The hotel amenities include a playground	0.083	0.277
Spa	The hotel amenities include a spa	0.083	0.277
Table Tennis	The hotel has table tennis facilities	0.103	0.304
Tennis	The hotel has tennis courts	0.295	0.457
Bus Station	The hotel is situated next to a bus station	0.045	0.208

**Note.** The sample originates from the catalogs of a private tourist agency, and it consists of 92 hotels that were in operation during March and/or July 2017. Of the variables listed above, only "Nicosia" is not included in the subsequent estimations. That is equivalent with rendering the hotel rooms offered in the district of Nicosia as the "reference group," that is the group with which all comparisons presented in Table 4 are being made.

<sup>5</sup> A variant of the general-to-specific approach proposed by Hendry (1983) is applied to all three cases (i.e., whole sample, summer sample and winter sample), where a general model is simplified to characterize the related empirical evidence using the least number of variables. The specific approach includes running five stepwise regressions in each case: a general model including all proposed explanatory variables and other four models each containing only the explanatory variables of a specific category. The categorization used is: (a) basic hotel characteristics (Espinete et al., 2003), (b) hotel amenities (Juaneda et al., 2011), (c) room amenities (Fleischer, 2012) and (d) external factors (Chen & Rothschild, 2010). The variables selected are the ones whose coefficients appear statistically different from zero at 5% in both the general model and the related category-specific regression. For better comparison of the results (presented in section 5) if a variable is selected in one model (e.g., summer sample) then it is also included in the rest.

and through direct communication with the management of the hotels included in the sample.

The final set of hotel characteristics examined include both quantitative and qualitative factors. A quantitative factor examined is the hotel star rating, which is measured as the total number of stars awarded to the establishment, while the qualitative factors employed in the current study include the district, facilities, and other amenities of each hotel. These latter characteristics are measured on a binary scale, in which 1 indicates presence and 0 indicates absence of the specific characteristic or feature in each hotel.

#### 4. Method

Hedonic price analysis (HPA) has been developing over the last decades to determine implicit prices embedded in heterogeneous products. As mentioned previously, this technique originates from Lancaster's (1966) approach to consumer theory which was formally established by Rosen (1974). As a result of the developments observed in the tourism and travel industries in the last decades (Papatheodorou et al., 2012), HPA has received considerable attention in the related literature, especially in the analysis of hotel room rates (see, e.g., Portolan, 2013; Pawlicz & Napierala, 2016; Wang et al. 2019).

In its most parsimonious manifestation HPA considers the market value of any heterogeneous good or service as a function of the implicit prices (i.e., consumers' willingness-to-pay) of the attributes comprising the specific product. This function may be estimated via an appropriate econometric model and, therefore, allow policymakers and practitioners to draw informed conclusions concerning the market in which the specific product is offered. The issue of choosing the most appropriate functional form has received considerable attention in the related literature (see, e.g., Espinet et al., 2003; Thrane, 2005), with many researchers deciding to estimate hedonic regression models using a log-linear approach: the independent variables being expressed in levels and the dependent variable being expressed as a logarithm (e.g., Thrane, 2007).

In the log-linear approach each estimated coefficient is interpreted as a percentage change in the dependent variable associated with one-unit increase in the independent variable (see, e.g., Fleischer,

2012). However, this straightforward interpretation does not apply in the case of dummy variables' coefficients, where the desired value should be calculated according to Halvorsen and Palmquist (1980). The basic hedonic log-linear model is expressed as follows (Espinet et al., 2003):

$$P_i = \alpha + \beta X_i + \varepsilon_i, \quad (1)$$

where  $P_i$  is the logged room rate,  $\alpha$  is the constant term,  $X_i$  represents all factors which may determine the accommodation price (e.g., the location of the hotel, its star rating, whether the amenities include a spa, and so forth),  $\beta$  is a vector of coefficients which account the degree that each of those characteristics or attributes may affect the price of the hotel room (i.e., the hedonic or implicit prices) and  $\varepsilon_i$  is a random error.

Summarizing the information presented above, the current paper applies a semi-log form of the hedonic regression model, where the dependent variable is the hotel room price and the independent regressors are the explanatory variables listed in Table 3. Three regression models are estimated: Model 1 (utilizing the whole sample), Model 2 (using only the summer sample) and Model 3 (using only the winter sample).

#### 5. Results

All empirical findings are presented in Table 4. In general, the values of the adjusted R-squared are high (between 73% and 80%), indicating that all three models are a good fit for the data. Multicollinearity presents a major concern when performing hedonic price analysis (Chen & Rothschild, 2010), therefore the variance inflation factor (VIF) is used for detecting the seriousness of such an issue. Since a VIF value greater than 10 it is generally considered (see, e.g., Kennedy, 1985) as evidence for multicollinearity, the fact that the covariates included in all three models indicate a mean VIF value that does not exceed the number three is a strong indicator that multicollinearity is not an issue in the current study. Furthermore, the values of diagnostic tests, such as RESET, Breusch-Pagan and White, suggest that none of the models estimated in the present paper suffers from issues related to heteroscedasticity or misspecification.

**Table 4.** Estimation Results and Diagnostics

Variable	Model 1: Combined Data Set	Model 2: Summer Data Set	Model 3: Winter Data Set
Location			
Famagusta	0.029	0.276***	0.428***
Larnaca	-0.269***	-0.039	-0.505***
Limassol	-0.054	0.156	-0.275***
Paphos	0.019	0.266***	0.258***
Troodos	-0.222**	-0.118	-0.278**
Star Rating	0.282***	0.301***	0.271***
Air Condition	-0.145**	-0.142*	-0.099
Radio	-0.138**	-0.105	-0.159**
Telephone	0.292***	0.217***	0.189
Indoor Pool	-0.170***	-0.210**	-0.080
Playground	-0.197***	-0.300***	-0.229**
Spa	0.280***	0.317***	0.187*
Table Tennis	-0.192***	-0.228**	-0.160*
Tennis	0.197***	0.229***	0.141
Bus Station	-0.280***	-0.279***	-0.264**
Intercept	3.157***	2.878***	3.041***
Number of Observations			
	154	90	64
Adjusted R-squared			
	0.750	0.734	0.795
Variance Inflation Factor (VIF)			
	2.14	2.16	2.69
Ramsey RESET (p-value)			
	0.420	0.196	0.588
Breusch-Pagan Test (p-value)			
	0.201	0.513	0.114
White Test (p-value)			
	0.584	0.903	0.169

**Note.** Table 4 presents results from estimating hedonic pricing models for the hotels in Cyprus. The estimated coefficients express the effects of various attributes on the hotel room price, as compared with the reference group (i.e., economy-class hotels located in the district of Nicosia). (\*\*\*) denotes statistical significance at 1%, (\*\*) at 5%, and (\*) at 10%.

Since the analysis in the current study employs mostly dichotomous discrete (dummy) variables, it is reminded that the interpretation of statistically significant coefficients of dummy variables should be performed by calculating their antilogarithmic values, as suggested in Halvorsen and Palmquist (1980):

$$100 \cdot (e^{\text{coefficient}} - 1). \quad (2)$$

Those values correspond to the percentage unit differences between the covariates and the intercept term (i.e., estimates of the effects of the corresponding attributes in percentage terms). The constant term of each model refers to the room rate of an economy-class hotel (i.e., rating: 2 stars) located in the district of Nicosia and that offers none of the amenities listed in Table 3.<sup>6</sup>

The estimation results from Model 1 (whole sample) indicate that 12 variables generate a significant impact on the prices of the hotel rooms in Cyprus.

Nine of those factors influence hotel rates with a confidence level of 1%, those including hotel location (district of Famagusta), the official star rating, presence of direct-dial telephone in the room, existence of spa, a playground on the hotel premises and proximity to a bus station. Three variables affect hotel rates with a confidence level of 5%, those being hotel location (Troodos mountains), presence of a radio in the room and air-conditioning. However, since Model 1 is estimated from both summer and winter period observations, there is always the probability that it conflates and therefore misrepresents the relations that the present study seeks to identify. For this reason, it is probably best to focus on the results from Models 2 and 3, where the estimations are carried out separately for the summer and the winter season.

In Model 2 the results indicate that only four attributes have positive effects on room rates. As in Wang et al. (2019), the rates in hotels with spa are higher (about 37.3%) as compared with those

<sup>6</sup> The imputed cost per night for accommodation in an economy-class hotel in the district of Nicosia (which has none of the attributes examined in the current study) is equal to €23 in Model 1, €18 in Model 2 and €21 in Model 3 (see Wooldridge, 2012, pp. 203–4, for an explanation of how these values are derived).

in hotels without this amenity. The room prices in hotels with access to tennis courts are also higher (about 25.7%) than those in hotels without such an access, a result also present in Alegre et al. (2013), among others. The prices of rooms which include a telephone device are 24.2% higher than rooms where the presence of direct-dial telephone is not advertised in the travel agent's catalog. Turning to the star rating variable, this also has a positive and pronounced effect on overall hotel room prices. More precisely, the analysis suggests that one extra star in the hotel's official rating is associated with a 30.1% increase in the hotel room rates. This is in accordance with the results of many previous studies, such as Schamel (2012), who finds that star rating accounts for about 30% of the overall hotel price, and Thrane (2005), who indicates that hotel star category mediates the effects of other variables.

While the attributes listed in Table 2 are all expected to increase the quality of the hotel room and thus have a positive impact on its price in all seasons, some of those variables, such as the existence of radio in the room, are not indicated as significantly influencing the hotel room rates in the summer period.<sup>7</sup> One possible explanation is that the summer period customers are mostly leisure travelers, who use the hotel room only for accommodation, spending more time relaxing by the beach, sightseeing or exercising outdoors. The winter period customers, on the other hand, fall more in the businesspeople category, for whom amenities which allow comfort and rest within their room, such as access to radio music, are more important. Therefore, access to outdoor facilities, such as tennis courts, would be more appealing to the hotel customers during the summer period, than within-the-room entertainment choices, such as existence of a music radio.

The results in Model 2 also indicate five hotel attributes with a negative effect on room rates. The calculations suggest that hotels who advertise the fact that their rooms are air-conditioned are about 13.2% cheaper than hotels where such an amenity is not included in the travel agent's descriptions.

This is consistent with the argument that hotels of high standard are anticipated to provide such basic comforts anyway, therefore the travel agent advertises this feature only for hotels of a lower standard. The rates in hotels offering table tennis facilities are about 20.4% lower than establishments where such access is not advertised in the travel agent's catalog, while the existence of a playground on the premises reduces the room rate by 25.9%. The latter findings are consistent with Haroutunian et al. (2005), in which it is concluded that amenities such as table tennis and playgrounds are not considered as an attractive feature for a hotel of high standard, as it may be for a hotel of a lower standard (and price) with a clientele consisting mainly of families with children.

A particularly unexpected finding is that hotel rooms in the proximity of a bus station are typically about 24.3% cheaper than those of hotels lying away from such public transportation hubs. Another startling finding is that the presence of an indoor swimming pool lowers the room rate by about 18.9%, *ceteris paribus*. The author returns to these question-raising topics below.

Regarding the location variables, it is reminded that each related coefficient indicates the difference of the price of a hotel room located in the districts of Famagusta, Larnaca, Limassol, Paphos, or Troodos, respectively, from the price of a similar hotel room located in the district of Nicosia. The results in Model 2 indicate that the price of a hotel room located in the district of Famagusta is 31.6% higher than a similar room located in the district of Nicosia, with the corresponding estimate for the district of Paphos being 30.5%. Famagusta and Paphos being indicated as the most expensive hotel rooms in the whole island is hardly surprising, considering that the study of Papatheodorou (2002) finds these two specific Cypriot destinations to be associated with the highest willingness to pay in the entire Mediterranean region. There is no evidence for statistically significant hotel room rate differences between the districts of Nicosia, Larnaca, Limassol and Troodos.

<sup>7</sup> It is reminded that all three models presented in Table 4 are outcomes of stepwise regressions procedures. Data for more than 90 hotel characteristics and attributes anticipated to affect the room rates are collected from the travel agent's catalogs, but only 15 of them are finally indicated to have a statistically significant effect at a 5% confidence level. Therefore, the estimations of the current study indicate that many hotel "quality" characteristics advertised in the travel agent brochures do not actually have an effect on the room rates.

The results in Model 3 (winter sample) indicate that some attributes, such as location (Famagusta and Paphos), the official star rating, existence of a spa, playground, and table tennis facilities, are indicated to affect room prices in both the winter and summer estimates. However, some other attributes, such as air-conditioning, direct-dial telephone, indoor swimming pools and tennis courts, become insignificant in the winter sample estimates, while other characteristics, such as the presence of radio in the room and certain location variables (Larnaca, Limassol, and Troodos) switch from insignificant to significant.

One explanation for the music radio variable becoming significant in Model 3 estimates is that within-the-room entertainment is more appealing for a winter business visitor (requiring the room for relaxation between conference sessions and business meetings) than for a summer leisure visitor (using the room mostly in the late hours, after engaging in outdoor activities). However, the related coefficient has the opposite sign of what one would expect. This result is hard to explain with the available information.

A reason for the air-conditioning and the tennis variables becoming insignificant in Model 3 estimates is that the winter visitor is more likely to need a central heating unit rather than an air-conditioning device and, also, would not be very keen on exercising in outdoor facilities (such as a tennis court), where adverse weather conditions would be even less welcome. However, the fact that winter travelers typically prefer outdoor to indoor activities makes it hard to explain that the telephone and the indoor pool variables turn out insignificant in the winter estimates.

It is interesting to note that in both the winter and the summer estimates the room rates in hotels located close to a bus station are suggested to be lower than those in hotels outside the public transportation routes. One possible reason for this inverse relationship between room rates and proximity to a bus station (something which contradicts both economic intuition and the empirical findings of previous studies) is that in Cyprus hotels located outside the public transportation routes are usually associated with exquisite resorts, offering a variety of expensive facilities, such as wellness clubs and athletic fields (Chen & Rothschild, 2010).

In Model 3 the coefficients for the location show that if the hotel is in the district of Famagusta, then its room rate is increased by 53.4%, while if it is in the district of Paphos, this increases its room rate by 29.4%. The results also indicate that if the hotel is in the district of Larnaca, this decreases its room rate by 39.6%, while the corresponding estimates for Limassol and Troodos are  $-24\%$  and  $-24.3\%$ , respectively.

Finally, the results above should be viewed with some caution. Not only it is difficult to obtain sufficiently detailed information from travel agents' catalogs to enable precise identifications of what each hotel is offering, but there is also a possibility that the room rates may be unrelated with the hotel amenities, especially during the winter season. According to Ms. Tanou, vice president in a major travel agency, in Cyprus what really matters in hotel room pricing may not be the characteristics of each hotel, but whether the specific establishment is popular within the local tour operators. If the hotel is quite popular then many of its rooms will be occupied and it will keep its prices high. If, on the other hand, the specific hotel is relatively unpopular then it will have many rooms available, and its prices will be forced down.

Also, according to Mr. Rousounidis, director general of Cyprus Hotel Association, the hotels in Cyprus face decreased costs during the winter season, due to their loan repayment schemes (which distribute most of the payments in the summer) and the significantly lower number of staff they employ during winter. Many hoteliers would choose to combine this significant cost reduction with a room rate decrease, to have greater chances for profits in a demand-low period.

## 6. Conclusions

The present study investigates which attributes are significant in determining the hotel room prices in Cyprus. The author employs models for both the summer and the winter periods of the island's touristic activity and the empirical results are accompanied with some plausible explanations. While some variables, such as the official star rating of the hotel and existence of spa amenities, are indicated to affect room prices in a predictable (positive) way, certain variables, such as air-conditioning and proximity to

a bus station, are indicated to affect room rates in a counterintuitive (negative) way. Also, the impact of many explanatory variables varies according to the season being considered.

Economic theory suggests that the statistically significant characteristics are also vital in the consumers' assessment of the Cyprus tourism product. Since the paper finds that top-priority considerations that consumers have in mind when choosing a place to stay in Cyprus include its official star rating and certain facilities and amenities, the findings suggest that an addition of the specific attributes may significantly enhance accommodation prices and increase hoteliers' remunerations, especially in the winter season where both results and experts' opinions suggest a "tricky" situation. Since the study also suggests that advertising certain features of the hotel in the travel agents' brochures may be sending signals that are perceived in a negative manner by the consumers, hoteliers should consider excluding the specific attributes from their establishments' description.

For the above stated reasons, the current study contributes to the literature by applying the hedonic price model to yet another geographical region and also by providing a novel understanding of the Cypriot hotels pricing process. Future contributions to the literature might focus on exploring the subject using data collected from internet sources (such as online ratings) and for a considerably longer time period, in order to explore the impact of seasonality a bit further.

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