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The Rental Prices of the Apartments under the New Tourist Environment: A Hedonic Price Model Applied to the Spanish Sun-and-Beach Destinations

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Abstract: The purpose of this article is to estimate a model of hedonic prices that is applied to apartments that are rented in the Spanish coastline, based on data that has been provided by Tecnitasa. The results confirm the relevance of the determinants that were previously identified by the literature and point to new determinants, such as tourism competitiveness and online reputation, as future drivers of prices in the new tourist environment.

Keywords: hedonic prices; rental prices; collaborative economy; Spain

JEL Classification: Z30; R30

1. Introduction

The analysis of the elements that determine the profitability and prices of tourist accommodation is not a novel subject. The literature on tourism collects a myriad of articles analyzing the prices of apartment rentals and hotel rooms in countries, cities, and tourist areas around the world. In Spain, interest of researchers on the subject began at the turn of the century. Authors, such as Coenders et al. (2001), Uriel and Ferri (2004), Saló Mayolas (2005), Juaneda et al. (2011), and Raya Vilchez (2013), among others, have studied the determinants of apartment rental and hotel prices through the hedonic price analysis technique, which was popularized by Rosen (1974).

Economic theory prescribes that prices are determined through the mechanism of supply and demand. Beyond this, however, evidence in the literature from a supply-side viewpoint and using hedonic price techniques, has revealed that the characteristics of the house—the number of bathrooms, bedrooms, etc.—and the characteristics of the environment—the neighborhood, season of the year, distance to the beach, etc.—are also important in determining the rental market prices (Monty and Skidmore 2003; Hamilton 2007; Thrane 2005; Mangion et al. 2005). In the Spanish case, the most recent study on the subject is that of Raya Vilchez (2013), which analyzes the effects of location and seasonality on a set of eight Sun-and-Beach tourist destinations that are located in Catalonia (Lloret de Mar and Alt Maresme), the Balearic Islands (Calvià and Alcudia), Alicante (Calp and Dénia), and France (Argèles-sur-Mer and Colliure). This study indicated that (1) higher quality apartments (three or four stars, more rooms, and more facilities—such as parking or swimming pool) are associated with higher rental prices in almost all of the price ranges (quantiles) of the distribution; (2) the location (destination) matters, with higher prices in Lloret de Mar, Alcúdia, and Calvià than in other places, especially those in the low–mid range of the price distribution. The top quantiles are less affected by

location; and (3) seasonality affects price range differently, the mid and low prices ranges being the most affected by this phenomenon.

Recently, the study of the determinants of rental prices has acquired a renewed interest. Simultaneously, the emergence of the collaborative economy is revolutionizing the rental market of many tourist destinations. The generalization of rent through platforms such as Airbnb has revived the importance of the studies relating to the determination of rental prices and their consequences elsewhere. Nelson (2010), Benjamin et al. (2001), Ariza et al. (2012), and Tsai et al. (2016) are examples of papers that analyze the determination of sales or rental prices in different countries—namely, the United States, China, and Spain—using a set of variables—such as the type of tourist activity, comfort, the influx of tourists, and even the prohibition of smoking, etc.—and the impact of the new distribution channels on these prices. In Spain, the focus of many investigations is to understand whether we are entering an irreversible process of gentrification or, in our context, touristification of big cities, such as Madrid, Barcelona, and Valencia.

Regarding the irruption of the collaborative economy, the irruption of online platforms, such as Airbnb, is observed in an ambiguous way by the literature. Thus, some authors—for example, Lee (2016) for the case of Los Angeles, Gant (2016) and Gutiérrez et al. (2017) for the case of Barcelona, and Zukin et al. (2015) for the case of New York—have highlighted the negative effects that the generalization of rent—through platforms of the collaborative economy—has caused in many cities and tourist destinations. These effects result in the displacement of the traditional residents from the city centers or tourist destinations to other peripheral neighborhoods with poorer facilities and environments. However, other authors, such as Levendis and Dicle (2016), and Groizard and Nilsson (2017), consider the irruption of this new offer to be altogether positive for the city. In general, the literature confirms the existence of rising prices in the main tourist cities (whether or not they are holiday destinations), which changes the ecosystems of the most popular neighborhoods and contributes to increased pressure on some areas and tourist spots that are already saturated. The generalization of low-cost transport has accelerated the demand for tourist use, further highlighting this trend. Consequently, this allows for citizens to take short trips elsewhere throughout the year, so that the apartments can always be rented for tourists.

In the Spanish case, however, there is a lack of studies analyzing the impact of the new platforms on traditional tourist destinations that are beyond the main cities in which the platforms are initially developed. Furthermore, there is a scarcity of studies that analyze the existing situation immediately preceding the irruption of the collaborative economy platforms, which could make it difficult to perform comparative analyses in order to establish the impact of the new environment of destinations in the future.

This exploratory paper aims to address this gap in the literature. It attempts to shed light on the subject by analyzing, using the hedonic price regression technique, the principal features of the dwellings—independent of their commercialization channel (whether or not a collaborative economy)—that determine the rental price in a sample of Sun-and-Beach tourist destinations—located in Spanish coastal areas—during the high season. This article serves several purposes. Firstly, it aims to confirm certain results that were found in the existing literature concerning the Spanish case, by using the most recent data on the topic and a wider sample of 51 destinations (see Table A1 in the appendix). Secondly, by including new variables—representing competitiveness of destinations and their online reputation—in the analysis, it serves to identify the effects of these new tourist phenomena, which were generally ignored by the previous literature on the topic. Thirdly, the exercise also serves as a basis for future studies that—given the growing interest of the scientific community in the impact of the collaborative economy—could compare the main determinants of the rental prices for apartments in destinations that are marketed by collaborative economy platforms, such as Airbnb, and those that are commercialized by other traditional channels. Finally, since the study uses data corresponding with the moment immediately preceding the generalization of the new platforms, it would also aid in the establishment of a baseline that could be used to determine the impact that the appearance of

these new platforms could have on the rental prices of destinations in future research. For all of these reasons, in the Spanish case at least, the article represents an advance over the existing literature on the topic.

2. Methodology and Data

This article used the linear regression methodology to estimate a hedonic price model. The rental prices of tourist apartments in the main Spanish holiday destinations were used as a dependent variable. The data on rental prices came from Tecnitasa—a consultant specializing in this field—and referred to a sample of 51 homes taken from the month of July 2015 (high season). Several of the variables that had previously been identified by the literature were used as explanatory variables, representing the characteristics of the housing, the presence of residential tourism in destinations, and the determinants of the competitiveness of the tourist destinations in which they were located (see Table 1). Table 2 presents the descriptive statistics of the considered variables.

The use of this methodology was justified by its popularity in the existing literature. In fact, methods that break down the price into its components have been applied for several decades. This methodology has evolved to decompose each product based on its characteristics (Rosen 1974; Fluvià et al. 2011); the products are decomposed into groups of components, in which the total price of a product is the aggregate of all implicit prices in each of its attributes. The methodology is particularly useful for measuring the impact of specific elements on the value of goods and services through a multiple regression analysis. In this way, the function of the price (P) can be expressed as follows:

$$P_{it} = ß_0 + ß_1 X_{1it} + ß_2\ X_{2it} + \ldots + ß_j\ X_{jit} + e_{it},$$

where P*i* is the price of each good *i*, X*i* are the characteristics of each good *i*, and e represents the error term of the regression. In the case of tourist rentals, the distance to the coast, the month of the year, and attributes such as the number of beds or rooms have been proven to be relevant variables in determining the price of the accommodation.

Thus, in the case of the tourism sector, the model could take the following form:

$$f(Price) = f(H,L,T)$$

where H is the set of variables that properly define the dwelling (characteristics of the property, location, etc.), L is a vector of specific variables related to the place where it is located (environment, pollution, type of population, etc.), and T represents the elements that determine the tourist activity in the environment (type of tourism, visitors, quality of coasts, etc.).

Table 1. Variables and sources.

Type of Variables	Variable	Description	Source
H (Houses characteristics)	Weekly rent (Priceweek)	Rental price per week and square meter	Tecnitasa 2014–2017
	Location (Beachfront)	Located in the beachfront = 1, other = 0	Tecnitasa 2014–2017
	Typehouse	Type of housing, 1 apartment, 0 flat.	Tecnitasa 2014–2017
	Suphouse	Size of the house m^2	Tecnitasa 2014–2017
L (Destination characteristics)	Nhouse11	Number of homes in the 2011 census of the destination.	National Statistics Institute (INE)
	Aerop70	Number of airports within a 70 km radius.	Authors own elaboration
	Coast	Km of coast in the destination	Department of agriculture
	Density11	Population density (2011 census)	National Statistics Institute (INE)
	Bflag11	Number of Blue Flags in the destination.	European Foundation for Environmental Education
	Unreg12	Unemployment rate over the potentially active population in the destination.	National Statistics Institute (INE)

Table 1. *Cont.*

Type of Variables	Variable	Description	Source
	Sec11	Percentage of secondary houses in the 2011 census of the destination.	National Statistics Institute (INE)
	Porfor11	Percentage of foreign population in the destination in the 2011 census	National Statistics Institute (INE)
	Pmay6511	Percentage of people over 65 at the destination in 2011 at the destination.	National Statistics Institute (INE)
T (Tourist activity on the environment)	Region	Region where the destination is located (Catalonia, Valencia, Murcia, Andalusia, Canary Islands, and Balearic Islands)	Authors own elaboration
	Monitur14	Tourist competitiveness of the region in 2014	Exceltur (2016)
	Reponline	Online reputation in 2016	Socialvane (2016)

Authors' own elaboration.

Table 2. Descriptive statistics.

Variable	Mean	SD	Skewness	Ex. Kurtosis
Weekly rent (Priceweek)	671.27	342.53	1.4232	1.6153
Suphouse	70.52	17.08	1.950	7.7698
Nhouse11	29,970	20,046	2.4089	7.8578
Aerop70	0.7647	0.5509	−0.0752	−0.2950
Coast	16.110	12.147	1.8306	3.2801
Density11	1172.4	1514.7	2.1113	4.2094
Bflag11	2.4902	1.8695	0.9151	1.3887
Unreg12	13.60	4.4754	0.1158	−0.5883
Sec11	45.43	15,63	0.0390	−0.7949
Porfor11	8.60	9.47	1.7190	2.8287
Pmay6511	15.21	4.53	1.2797	1.1863
Monitur14	104.05	6.48	0.8055	0.1859
Reponline	75.78	5.27	−0.3128	−0.4966

Authors own elaboration.

3. Results

Table 3 reflects the results of the most satisfactory regressions that were carried out. In order to achieve these results, several preliminary regressions were performed. The first step was to check whether including all of the variables corresponding to the T (tourist activity in the environment) construct of Table 1 (EOA15, EOH15, Frontur16, Monitur14, and Regional Dummies) in the regression resulted in a perfect collinearity of all of the variables. Finally, we included the competitiveness variable (Monitur14) because we are of the opinion that it reflects a broader aspect of the tourism environment of the region than other variables, such as occupancy rates and arrivals, which only deal with partial aspects (basically the tourist demand of the region) of the tourism phenomenon. The second step was to examine the functional form of the model and develop a parsimonious model that captured most of the variability of our dependent variable. As usual, the selection criteria were the consistency of the signs of the coefficients with our previous expectations regarding interpretation and logical criteria, and other statistical criteria such as the adjusted R^2, AIC, and BIC. For these reasons, all of the variables that were included in Table 1 were not reflected in the final selected model, which is represented in Tables 3 and 4.

The model has a log-linear (log-lin) functional form. Therefore, the interpretation of the coefficient is that a one unit change in an explanatory variable represents a $100 \times \beta i$ percent change in the dependent variable Y. The explanatory capacity of the model is relatively high (Adjusted $R^2 = 0.75$), the estimated errors are normally distributed (Chi-Square 2 d.f = 1.38, p-value = 0.49), the collinearity analysis reveals that there are no major issues (only the variables Coast and its square, $Coast^2$, are highly

correlated), and all of the other variables present a Variance Inflation Factor (VIF) below 4.0 (with 10.0 being the maximum recommended threshold). Likewise, the coefficients of the models confirm the a priori expectation. Expanding the focus on the variables that are proxies for the features of the apartments from the local level to the regional level, it is evident that only the location of the apartments on the beachfront has a significant negative impact on the final rental prices, which is highly counterintuitive. However, this result could be because of the lack of discriminatory power of this variable in the sample resulting from issues with its categorization.[1] Conversely, as is expected, the size indicates a significant positive impact.

Regarding the elements that define the tourist activity in the municipality in which the apartments are located, the quality of the coast (Coast)—which attempts to capture this relationship between the natural competitiveness and the firm competitiveness of destination—appears to have an explanatory capacity in this model. However, it seems a decreasing effect—as highlighted by the negative coefficient of the square coefficient Coast^2 (which is intended to check for potential non-linearity effects in the model)—and the general idea that "more is better" is suggested in the exploratory analysis. The socio-economic environment of the destination is also a determinant of the rental prices of apartments. Thus, high unemployment rates are associated with lower levels of rental prices. Similarly, greater tourism specialization is associated with lower rental prices. This could be reflecting the preference of the high-income segment of the demand for less crowded destinations or alternatives to apartments, such as hotels, bungalows, and villas. At the same time, the negative (but not significant) coefficient, which is associated with the percentage of secondary homes existing in the destination, points to the existence of an excess of supply and higher competition in more consolidated tourist destinations. The lack of significance of the variable that reflects the total existing housing stock in the destinations is more controversial. This lack of significance could illustrate the inertia of the construction dynamics of the destinations, which tend to growth, regardless of the profitability that can subsequently be obtained by these houses in the form of rental prices. Additionally, it would explain why the construction activity in Spanish tourist destinations is restarted quickly and strongly after each episode of crisis (as soon as demand reacts), without taking into account other aspects such as the sustainability of the destination in which they are developed.

Finally, the variables regarding the regional tourist environment are significant, indicating that the rental prices of apartments have much to do with the tourist region in which they are located. Tourism competitiveness and the online reputation of the tourist brand of the region both show significant positive coefficients. There is also a penalty for apartments located in destinations belonging to the region of Valencia because, as a general rule, these destinations experience lower prices than those observed in the average of the destinations that are analyzed. The explanation for this phenomenon could lie in the highly competitive market for this type of tourist accommodation in an eminently residential region; in the medium–low demand for this type of product in the region; or in the commercialization characteristics of these apartments in a region where there is a strong component of opaque economy.

In summary, the analysis confirms the relevance of the characteristics of homes—as stated by the existing literature—and indicates the relevance of the environment variables (both local and regional) in determining the rental prices of tourism apartments. This suggests that the competitiveness and online reputation of the region in which destinations are located are also major drivers of prices in the new tourism environment.

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[1] The categorization of this variable in the database is not very clear. Sometimes, it is expressed as "Beachfront"—this is the category that we have categorized as "1" (Beachfront) in our database—but sometimes, the location is expressed in terms of a specific place (e.g., 'Oriental coast', 'Seafront', or 'Harbor'), or in terms of the name of an urbanization, etc. This makes it very difficult to distinguish whether or not the dwelling is actually in a beachfront location.

Table 3. Cross-sectional OLS-dependent variable: l_Priceweek. 2015.

Variable	Coefficient	Standard Errors	*t*-Statistic	*p*-Value
const	1.5182	0.8028	1.891	0.0661 *
Beachfront	−0.4144	0.1094	−3.785	0.0005 ***
Suphouse	0.0100	0.0015	6.515	<0.0001 ***
Reponline	0.0110	0.0058	1.883	0.0672 *
Monitur14	0.0374	0.0076	4.873	<0.0001 ***
Coast	0.0319	0.0124	2.567	0.0142 **
Nhouse11	1.488×10^{-7}	2.37×10^{-6}	0.062	0.9504
Itur12	−0.0001	4.49×10^{-5}	−2.533	0.0154 **
$Coast^2$	−0.0004	0.0002	−1.884	0.0670 *
Sec11	−0.0024	0.0019	−1.265	0.2134
Unreg12	−0.0345	0.0095	−3.633	0.0008 ***
Valencian region	−0.4564	0.1012	−4.508	<0.0001 ***
Mean of. dep. Variable	6.401494	D.T. de la vble. dep.		0.455753
Sum of squartes of residual	1.990985	D.T. de la regresión		0.225944
R-square	0.808292	Adjusted R squared		0.754221
F(11, 39)	29.98014	*p*-value (de F)		1.28×10^{-15}
Log-verosimilitud	10.33564	Akaike Criterion		3.328716
Schwarz Criterion	26.51062	Hannan-Quinn Criterion		12.18721

* indicates significance at the 10 percent level ** indicates significance at the 5 percent level *** indicates significance at the 1 percent level. HC1heterodekacticity consistent standard errors.

Table 4. Model 2: Pooled OLS-dependent variable: l_Priceweek. 2014–2017.

Variable	Coefficient	Standard Errors	*t*-Statistic	*p*-Value
const	1.1837	0.7684	1.540	0.1308
Beachfront	−0.1892	0.1155	−1.638	0.1086
Suphouse	0.0114	0.0013	8.702	<0.0001 ***
Reponline	0.0241	0.0065	3.680	0.0006 ***
Monitur14	0.0266	0.0081	3.269	0.0021 ***
Coast	0.0308	0.0093	3.285	0.0020 ***
Nhouse11	1.252×10^{-6}	2.11×10^{-6}	0.5911	0.5576
Itur12	-2.109×10^{-5}	4.635×10^{-5}	−0.4551	0.6514
$Coast^2$	−0.0004	0.0001	−3.426	0.0014 ***
Sec11	0.0006	0.0020	0.2996	0.7659
Unreg12	−0.0280	0.0088	−3.176	0.0028 ***
Valencian region	−0.5431	0.1065	−5.098	<0.0001 ***
Mean of. dep. Variable	6.377682	D.T. de la vble. dep.		0.498188
Sum squared resid	16.07126	S.E. of regression		0.313042
R-squared	0.629980	Adjusted R-squared		0.605162
F(11, 43)	39.39165	*p*-value(F)		7.56×10^{-19}
Log-likelihood	−39.10948	Akaike criterion		102.2190
Schwarz criterion	140.2648	Hannan-Quinn		117.6502

* indicates significance at the 10 percent level ** indicates significance at the 5 percent level *** indicates significance at the 1 percent level. Robust (HAC) standard errors. Pooled OLS using 176 observations, including 44 cross-sectional units, time-series length = 4.

4. Conclusions

The analysis, using hedonic price techniques, of tourism is of increasing relevance in the face of the continuous changes that the industry has been undergoing in recent years. The collaborative economy has put into question almost all of the business areas within the tourism sector, by finding alternatives to traditional business models, such as hotels, restaurants, travel, and even leisure. This study—which was carried out using the most recent data available on an amplified sample of Spanish Sun-and-Beach coastal destinations—has reinforced the previous results found in the literature and points to new determinants—such as region competitiveness and online reputation—as drivers of rental prices in these destinations.

The study has several limitations, the most important of these being that it is not possible to distinguish the week that the price refers to with the available data, which is most likely a major

determinant of the rental prices of dwellings. Another limitation is that the beachfront variable should be better defined in terms of categorization—as we have explained above, the categorization of this variable in the database is confusing, as it is difficult to distinguish whether or not the dwelling is actually in a beachfront location—in order to observe the accurate effect of the home location. Likewise, the beachfront variable—which most likely interacts with the region variable, because the beachfront of a property located in the region of Valencia is completely different to the property of a property located in the Balearic Islands—would need further analysis through an interaction term, but this is not possible with the sample size available in this paper. However, the exercise would serve as a basis for future studies that—given the scientific community's growing interest in the impact of the collaborative economy—could be conducted on this topic. In any case, at least in the Spanish case, the article represents an advance over the existing literature on the topic.

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Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

Table A1. Analyzed destinations.

Destination	Region
04064 Mojácar	Andalusia
04100 Vera	Andalusia
18140 Motril	Andalusia
11015 Chiclana de la Frontera	Andalusia
11014 Conil de la Frontera	Andalusia
11022 Línea de la Concepción (La)	Andalusia
11027 Puerto de Santa María (El)	Andalusia
11030 Rota	Andalusia
11033 San Roque	Andalusia
29051 Estepona	Andalusia
29054 Fuengirola	Andalusia
29069 Marbella	Andalusia
29091 Torrox	Andalusia
29025 Benalmádena	Andalusia
29075 Nerja	Andalusia
21010 Ayamonte	Andalusia
21060 Punta Umbría	Andalusia
07011 Calvià	Balearic Islands
07015 Ciutadella de Menorca	Balearic Islands
07026 Eivissa	Balearic Islands
07046 Sant Antoni de Portmany	Balearic Islands
07048 Sant Josep de sa Talaia	Balearic Islands
07054 Santa Eulalia del Río	Balearic Islands
38001 Adeje	Canary Islands
38006 Arona	Canary Islands
38028 Puerto de la Cruz	Canary Islands
35019 San Bartolomé de Tirajana	Canary Islands
08035 Calella	Catalonia
08056 Castelldefels	Catalonia
08270 Sitges	Catalonia
08307 Vilanova i la Geltrú	Catalonia
17118 Palamós	Catalonia
17023 Blanes	Catalonia
17048 Castell-Platja d'Aro	Catalonia
17092 Llançà	Catalonia
43037 Calafell	Catalonia
43905 Salou	Catalonia
30003 Águilas	Murcia

Table A1. *Cont.*

Destination	Region
30026 Mazarrón	Murcia
30035 San Javier	Murcia
03031 Benidorm	Region of Valencia
03047 Calpe/Calp	Region of Valencia
03063 Dénia	Region of Valencia
03082 Jávea/Xàbia	Region of Valencia
03133 Torrevieja	Region of Valencia
12028 Benicasim/Benicàssim	Region of Valencia
12138 Vinaròs	Region of Valencia
46105 Cullera	Region of Valencia
46131 Gandia	Region of Valencia
46181 Oliva	Region of Valencia
46220 Sagunto/Sagunt	Region of Valencia

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