The influence of the Primavera Sound festival on Airbnb prices

2024-03-25

Hypotheses

In this paper we are researching two hypoteses, concerning Airbnb prices during the festival Primavera Sound in Barcelona. The two research questions we are looking into are:

"Does the presence of a Summer Music Festival influence the prices of Airbnb listings in the respective city?"

"Is it possible to create a model that helps Airbnb hosts to define the pricings of their listings?"

To answer these hypotheses, two datasets for Airbnb listings are used and analyzed. From the data sets, the prices from during and before/after the festival are compared for the listings that are within 5 kilometers of the festival. The research objective is to discover if the prices for the Airbnb listings during the festival are different from normal, and if a model can be created that predicts these price differences.

Research analysis and results

For the analysis of this research the means for the prices of the listings within 5 kilometers of the festival, are calculated and compared for during the festival and before/after. Moreover, four different linear regression are performed to get a deeper understanding of the differences between these periods.

First of all, the summary statistics for the price during Primavera Sound and during a normal period are presented below (Table 1). From the table can be concluded that the prices for during the festival are on average lower than the prices when the festival is not happening. This is further proven by the linear regression in table 2. The table shows that when the festival is not currently happening, the price of the listing is higher by approximately 0.61. However this variable is not signifcant, which means it does not contribute significantly to explaining the difference in price.

Table 1: Summary statistics of the price during the festival and and normally

Variable	Mean	Median	Min	Max	Q1	Q3
during	155.9957	101	11	56815	64	153
off	156.6037	99	9	999	50	195

Table 2: The influence of the festival Primavera Sound on the price of Airbnb listings

	Coefficients	Std..Error	t.value	Pr...t..
(Intercept)	155.9957	0.9836	158.5915	0.0000
datasetoff_festival	0.6080	1.0524	0.5777	0.5634

Furthermore, Table 3 and 4 show that the minimum amounts of nights that you need to rent the listing, has an extremely different effect on the price of the listing during the festival. Before and after Primavera Sound, the price of the listings gets lower when the minimum amounts of nights is higher, while during the festival this is the opposite.

Table 3: The influence of the minimum of nights on the price during the festival

	Coefficients	Std..Error	t.value	Pr...t..
(Intercept)	-26.46401	2.2904698	-11.55397	0
minimum_nights	13.09140	0.0639717	204.64352	0

Table 4: The influence of the minimum of nights on the price before and after the festival

	Coefficients	Std..Error	t.value	Pr...t..
(Intercept)	171.8457	0.2122	809.6742	0
minimum_nights	-1.1324	0.0077	-147.4809	0

Lastly, a linear regression is shown with the influence of the number of reviews, the minimum nights, the room type and the neighborhood group on the price of the listings during the festival (Table 5). This linear regression gives a model that can be used by Airbnb hosts to define the pricing of their listings during Primavera Sound. The base model of the linear regression is an entire home/apt and a listing in the neighborhood group Ciutat VellaThis. From the regression can be concluded that price is positively influenced by minimum nights and number of reviews. This means that the more reviews a host has, the higher the predicted price will be. The same goes for minimum nights, the price will be expected to be higher when the minimum amounts of nights the listing has to be rented goes up. Both of the variables have also a p-value below 0.05, which means that both minimum nights and number of reviews are strongly associated with variations in the price of the listing. The p-values below 0.05 indicate that these variables are highly likely to have a genuine effect on the predicted price, rather than being due to random chance. This suggests that both minimum nights and number of reviews play significant parts in predicting the price for Airbnb listings.

Furthermore,there is also a significant difference in price revealed between the different neighborhoods and room types. The least expensive is a private room in Sant Andreu, and the most expensive is a hotel room in Horta-Guinardó. From this can be concluded that even though the listings are all within five kilometers of the festival, and consequently in a relative close proximity of each other, the neighborhoods are significantly different to influence the price to this degree. The difference between the least and most expensive neighborhood is 377.69 euros, and for the room types this is 234.61 euros. However not all the dummy variables have a p-value low enough to make them significant. The shared room and Nou Barris are not significant in this linear regression, meaning that they can not be interpreted. Nevertheless, the other dummy variables do have a significant influence, we can still conclude that there is a difference between the prices for the different room types and neighborhoods.

Table 5: Influence of number of reviews, minimum nights, room type and neighborhood group on price during the festival

	Coefficients	Std..Error	t.value	Pr. . . t..
(Intercept)	-168.7472	4.4214	-38.1662	0.0000
number_of_reviews	0.3487	0.0177	19.6819	0.0000
minimum_nights	13.7402	0.0650	211.5102	0.0000
room_typeHotel room	173.6938	16.6468	10.4341	0.0000
room_typePrivate room	-60.9174	4.9045	-12.4206	0.0000
room_typeShared room	30.8899	20.4900	1.5076	0.1317
neighbourhood_groupEixample	199.0648	5.0951	39.0698	0.0000
neighbourhood_groupGràcia	117.2842	9.0510	12.9581	0.0000
neighbourhood_groupHorta-Guinardó	318.3882	13.2223	24.0796	0.0000
neighbourhood_groupNou Barris	31.1814	21.8954	1.4241	0.1544
neighbourhood_groupSant Andreu	-59.3040	16.3777	-3.6210	0.0003
neighbourhood_groupSant Martí	120.7584	6.3994	18.8702	0.0000

Conclusion

The results from the analyses show the prices during the festival are lower than they normally are. However the variable of the linear regression is not significant, and should not be interpreted since it does not provide any meaningful explanation towards predicting the price. Furthermore, it was also possible to create a model with which the prices of listings can be predicted during the festival . The linear regression analysis shows a positive relationship between price and both minimum nights and number of reviews, supported by low p-values. Significant price disparities are observed across different neighborhoods and room types. While some dummy variables lack significance, indicating inconclusive interpretations, the overall analysis highlights the significant influence of minimum nights, number of reviews, and neighborhood characteristics on Airbnb listing prices during the festival.