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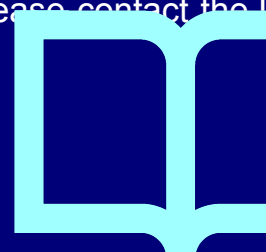
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Chapter 4

Pricing Rental Tourist Accommodation: Airbnb in Barcelona

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ABSTRACT

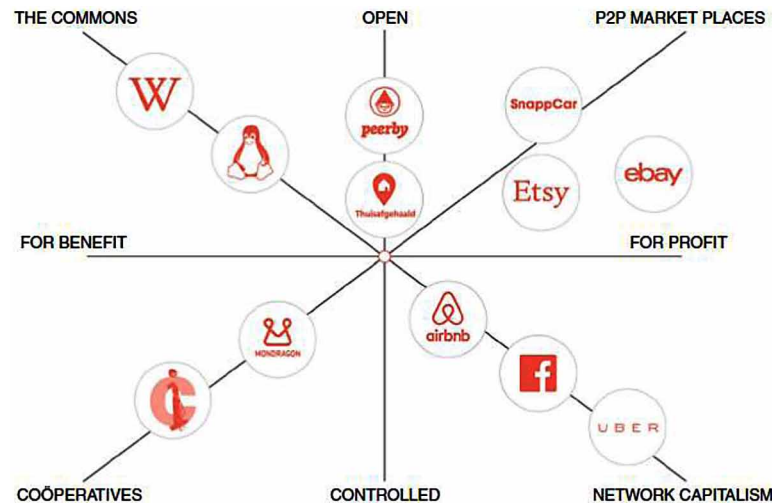
Digital marketplaces are rapidly flourishing, especially in travel and tourism services. Airbnb is providing one of the most evident examples of this successful evolution. Prices are a crucial factor to understand the business model and the economic performance in hospitality businesses. This chapter studies how prices are formed in Airbnb, focusing the analysis on a wide sample of accommodations listed in Barcelona (Spain). Contextual factors, lodging amenities and some hosts' attributes critically influence pricing in the digital platform. The accommodations located closer to the main tourist amenities concentrate most of the supply of rental services whereas consumer preferences for privacy and host identification give rise to higher prices. The research also confirms that commercial hosts exacerbate the upward movement of rental prices in the central districts of the city.

INTRODUCTION

The development and spread of information technologies has enabled the advent of highly-competitive digital platforms that promote user-generated content, sharing of goods and services and collaboration among members of the network (Kaplan & Haenlein, 2010). In particular, the sharing economy has emerged as a wide and diverse set of activities developed in digital platforms, facilitating the interaction between users and providers of goods and services to solve some market imperfections, regardless of whether they have commercial or unselfish purposes. These activities are addressing some situations

Figure 1. Typologies of networks operating as digital platforms

Source: Oskam and Boswijk (2016)



that conventional markets do not adequately resolve, both from a merely economic perspective as well as from social interest. Richardson (2015) reflects extensively the complex diversity of movements and ventures developed in this context.

In recent years, we have seen a proliferation of these online peer-to-peer marketplaces accompanied by the emergence of different business models. They are generating observable economic benefits associated with the decrease of transaction costs, the mobilization of idle resources or an increasing accessibility. Some of these digital intermediaries, promoting commercial networking activities through business models based on P2P, are transforming the market and tourist destinations, directly affecting the accommodation sector for tourism (Sundarajan, 2013). In particular, the emergence of Airbnb in many of the most populated destinations for tourism and leisure has disrupted the market for rental accommodation.

Although pricing is one of the most critical factors defining the business model and the economic performance in the hospitality business, the research on this topic is still scarce for rental accommodation services based on sharing economy models (Zhang et al, 2017). We focus our research on Airbnb listings in the city of Barcelona, one of the most successful tourist destinations in the Mediterranean region, to identify the key elements of price configuration.

AIRBNB IN THE UNIVERSE OF SHARING ECONOMY

Oskam and Boswijk (2016) represent the different types of value-generating networks that operate on the basis of digital platforms. Airbnb is placed in the field of network capitalism along with other major Internet operators, such as Facebook or Uber.

The company was created in 2008 and it has rapidly become a paradigmatic case of exponential organization, with a very fast evolution as its market was growing (Ismail et al, 2014). To understand this striking development, it is necessary to analyze the determining factors of economic success in networked accommodation. The platform acts like a two-sided market, facilitating transactions between

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individuals and adding value to both sides of the platform by providing a context of trust and reliability to both users and suppliers which otherwise would not be involved in the marketplace.

The company benefits from significant competitive advantages. On the one side, the cost savings derived from a minimal management structure and the coverage of expenses by the hosts who provide the accommodation. On the other, the network economies associated with the increase in the size of the market. The growth of the marketplace increases the visibility of the digital platform and makes it more attractive to the providers of accommodation services. The hosts are clearly motivated to join the network. Thus, the expansion of the marketplace yields higher returns to scale (Eisenmann et al., 2006). In addition, Airbnb exploits the experiential aspects of the rental accommodation in private houses and the sense of engagement and community. Users are encouraged to live a more authentic tourism experience (Ikkala & Lampinen 2015).

Obviously, the economic interests play a crucial role also both from the perspective of the users and the hosts. On the one side, guests obtain a better price and a higher flexibility. On the other, hosts benefit from the opportunity to increase the financial return of their properties (Botsmani Rogers 2011, Hamari et al., 2016, Zervas et al., 2017).

However, the Achilles' heel of this business model is trust, because when providers and consumers are facing a high level of risk and exposure, transactions between partners will only be effective if there is a substantial level of trust between them (Hamari et al, 2016). In the case of online transactions, there is a higher uncertainty about the behaviour of the involved agents (Riegelsberger et al. 2005). So, in contrast to the hotel industry, trust and reputation become the weaker link in the value chain of tourist accommodation rental, because these digital platforms lack the competitive advantages based on standardization, ranking and brand (Oskam & Boswijk, 2016). So, the mutual review system of hosts and guests could be the foundation of trust in Airbnb transactions, creating value as reputational capital allowing for higher prices (Finley, 2013; Wu et al., 2017; Ikkala & Lampinen, 2015; Teubner et al., 2017).

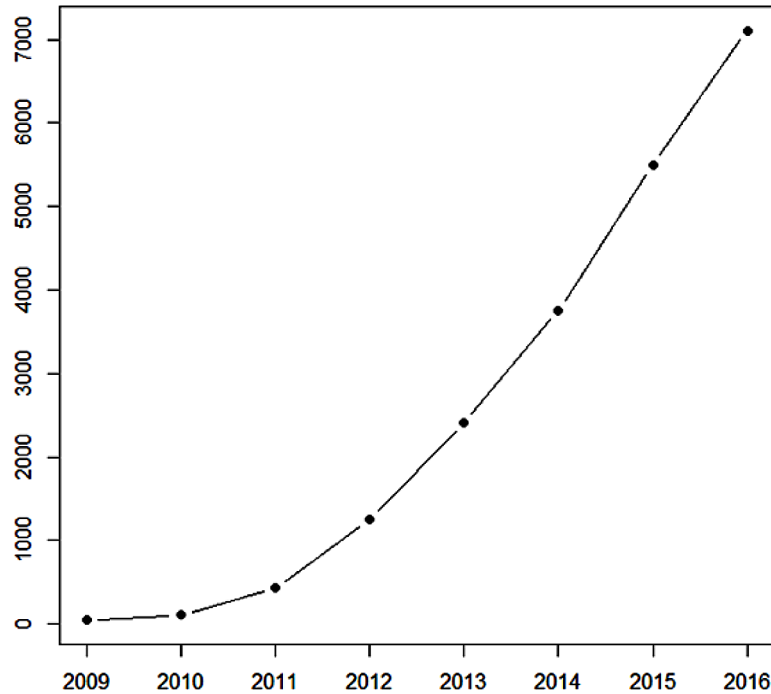
As a consequence, the P2P accommodation services face the necessity to create a user-friendly environment to offset the comparative disadvantage in terms of the lack of regulation and reputation, in a way that trust finally becomes one of the most critical elements for the value creation (Liang et al., 2017). This challenge to build a reputational capital could permit Airbnb to achieve even a greater economic performance. The initiatives of the company organizing and promoting an evaluation system by users should be comprehended in this context (Finley 2013).

The high-speed development and rapid implementation in many of the most populated destinations for tourism and leisure has disrupted the market for rental accommodation and generated a vivid and controversial debate about the negative economic externalities originated by its action in a context of ineffective regulation (Horn & Merante, 2017). Barcelona has not been an exception to this wave of critical approach. In several studies, the company is blamed for creating unfair competition, accelerating rents of housing for residents, increasing the cost of basic services or inducing urban gentrification and throwing resident population out from the downtown (Arias Sans, 2015; EY Spain 2015, Quijones 2015, Croft, 2015, Wachsmuth & Weisler, 2018). In fact, some authors point out a perfect political and regulatory storm has been detonated in the city (Dredge et al., 2016).

In turn, the company has provided alternative studies demonstrating that the improvement in efficiency and welfare has widely compensated the losses caused to some residents and the incumbent operators in the market (Airbnb 2013, Guttentag 2013, Lehr 2015). Whatever the case may be, it would be erroneous to consider Airbnb as a mere platform where private individuals exchange tourist accommodation services. The philosophy of sharing and reciprocity seems to be increasingly replaced by an

Figure 2. Airbnb: Evolution of the supply of rental accommodations in Barcelona

Source: Own elaboration from the information included in InsideAribnb.com



obvious commercial aim based on the concept of network capitalism and distant from the fundamentals of sharing economy (Belk 2014; Martin 2016).

The website <http://insideairbnb.com/> provides detailed information about many characteristics of the tourist rental accommodation services traded in the digital platform. The use of this database makes possible a better understanding of the activity developed by Airbnb in the city. The search was carried out with the data corresponding to October 2018. A significant sample of more than 6,890 registers (with ID number) has been analyzed to identify the main determining factors of prices, the importance of reputation and trust, the influence of professional hosts and the significance of location.

EMPIRICAL ANALYSIS

Location

The evolution of accommodations through the digital platform over time offers a clear evidence of Airbnb's defiance to the local hospitality business. As the platform is better known, it is also much more employed. The growth is continuous and violent, representing the increasing popularity of sharing economy in hospitality businesses.

The dispute becomes even more evident when comparing the geographical distribution of the accommodations included in the platform and the corresponding to the local hotel industry. Usually, the company has vindicated its activity on the presumption that is complementing the supply of the incumbent

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Table 1. Distribution of tourist accommodation

Urban District	Airbnb	Hotels
Eixample	29.51	32.60
Ciutat Vella	26.05	33.42
Sants-Montjuïc	11.63	6.03
Sant Martí	10.91	9.04
Gràcia	10.01	1.37
SarriàSant-Gervasi	3.75	8.77
Horta-Guinardó	3.44	2.47
Sant Andreu	1.79	0.55
Les Corts	1.73	5.48
NouBarris	1.17	0.27

Source: Own elaboration from the information included in InsideAribnb.com and in the website infoturbarcelona.com

industry without falling into direct competition and providing a housing offer usually located in districts where the presence of hotel accommodation is limited.

Our analysis makes clear that, at least in the city of Barcelona, this would not seem to be the case. The correlation between the geographical distribution of both hospitality networks is very high (92.7%), since Airbnb's highest supply is lodged in the two most central districts where the hotel industry is also densely located.

Price Dispersion and the Role of Dimension

Next, we study the determining factors of prices in the selected sample through a descriptive analysis. The study of pricing configuration could provide relevant information about the business model and the economic consequences of this networked hospitality service.

From the standard deviation of this variable (78.10), we can infer that there is a high dispersion of prices in the city. In addition, we detect a clear asymmetry (3.51). In fact, the median value (49.0) is significantly lower than the mean (73.60). This high dispersion could be the result of a great disparity in the type of tourist accommodations. As a consequence, we proceed to a complementary descriptive analysis of prices according to the number of beds supplied in each accommodation.

The first column shows the variable "number of beds", ranging from 1 to 16. It shows how the majority of lodgings offer between 1 and 2 beds (53.10%). For the purposes of this study, the accommodations with more than six beds are removed, due to their insignificance. It is also demonstrated that rental prices move upward according to the number of accommodates and that the dispersion is higher among the larger accommodations.

An analysis of the variance of prices according to the type of housing has been also carried out. The results confirm that the differences observed between groups, depending on the size of accommodation, are statistically significant.

Next, we proceed to validate whether the fact that there is a positive relationship between the number of beds and the price of the home offered by Airbnb is the main determinant of the high variability

Table 2. Descriptive analysis of prices by number of beds

Beds	Price	s.d.	IQR	0%	25%	50%	75%	100%	N
1	44.63	32.13	21.00	8	29.00	40.00	50.00	575	4025
2	70.66	55.27	51.00	9	38.00	56.00	89.00	695	1334
3	111.99	84.03	66.00	9	64.00	90.00	130.00	600	688
4	145.39	111.48	90.00	9	80.00	110.00	170.00	633	476
5	178.19	135.80	140.00	9	85.00	135.50	225.00	550	234
6	192.74	137.90	158.50	20	96.50	149.00	255.00	635	133
7	216.40	136.80	201.25	25	96.25	190.00	297.50	545	40
8	233.06	110.39	150.00	10	150.00	210.00	300.00	595	31
9	297.20	115.51	139.00	75	229.00	295.00	368.00	545	15
10	222.67	180.90	296.25	38	63.75	184.50	360.00	570	12
11	320.00	113.14	-	240	240.00	320.00	-	400	2
12	332.50	187.18	282.50	20	192.50	362.50	475.00	550	6
13	390.00	-	0.00	390	390.00	390.00	390.00	390	1
14	221.75	192.84	349.75	47	71.50	172.50	421.25	495	4
15	420.00	-	0.00	420	420.00	420.00	420.00	420	1
16	95.00	77.78	-	40	40.00	95.00	-	150	2

Source: Own elaboration from the information included in InsideAribnb.com

observed in the prices of accommodations in Barcelona. A simple linear regression analysis has been performed between both variables.

The significant influence of size is fully confirmed. However, it is moderate as much as only 30.10% of the variability of prices is explained by differences in the size of rental accommodations. Consequently, other determining factors should be included into the analysis. We have considered other variables, related to the number of guests (people that can be hosted) or the quality of the accommodation (number of bedrooms and number of bathrooms).

The result of the multiple regression analysis shows how the number of beds is still relevant to explain price variability and that the three new variables incorporated into the model clearly improve the goodness-of-fit (up to 38.70%).

Table 3. ANOVA of differences in prices according to the number of beds

	Sum of Squares	df	Mean Square	F	Sig.
Between groups	11247360.750	5	2249472.150	600.524	0.000
Within groups	25786425.230	6884	3745.849		
Total	37033785.980	6889			

Source: Own elaboration from the information included in InsideAribnb.com

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Table 4. Regression analysis between price and beds

	Coefficients	s.d.	T	p-Value
Constant	11.448	1.315	8.706	0.000
Beds	32.356	0.594	54.501	0.000
R-squared: 0.301				
F: 2970.379, p-value: 0.000				

Source: Own elaboration from the information included in InsideAribnb.com

Analysis of Airbnb as a Reliable Environment

As previously indicated, a critical in Airbnb's business model of Airbnb is reliability, since one of the main motivations of the company is to create a trusted environment, fully recognizable to users and customers of the marketplace. The rapid growth of tourism-related services based on the use of digital platforms is requiring a deep understanding of the trust mechanisms upon the marketplace is erected. With this aim, we have analysed the importance of the host identification on the prices of rental accommodation, regardless if this identity is or is not verified by the platform.

A contrast of hypotheses is conducted for the difference in average prices per accommodate. Although hosts with verified identity offer accommodations with a relevant higher unit price (25.35 euros) than non-identified hosts (24.97 euros), these differences are not statistically significant (t-statistic $t = -0.932$, p-value = 0.352).

However, despite differences are not important at the aggregate level, we detect significant divergences when we disaggregate the sample. In particular, as the presence of hosts managing multiple listings in the marketplace is growing over time (Li et al., 2015), we analyse the differences between professional and non-professional hosts, splitting the sample into two different subsamples. One of them containing information about those hosts having just 1 or 2 offers listed in Airbnb, and the other containing data about those commercial (or professional) hosts, having 3 or more housing offers in Airbnb. As a result of this split, we got that 37.70% of the listed offers came from professional hosts in Barcelona.

The results show a clear and statistically divergence. In the case of non-professional hosts (t-statistic = -2.073, p-value = 0.038) with verified identity the price is clearly higher (24.61 euros per accommodate

Table 5. Regression analysis between price and housing characteristics

	Coefficients	s.e.	t	p-Value
Constant	-15.144	2.141	-7.074	0.000
Accommodates	21.973	0.832	26.417	0.000
Bathrooms	7.296	1.676	4.353	0.000
Bedrooms	5.526	1.508	3.665	0.000
Beds	4.243	1.096	3.870	0.000
R-squared: 0.387, Adjusted R-squared: 0.386				
F: 1084.358, p-value: 0.000				

Source: Own elaboration from the information included in InsideAribnb.com

Table 6. Price per accommodate by host types and verification

	Total	Non-Professional	Professional
Host verified (N)	25.352 (2261)	24.608 (1392)	26.545 (869)
Host not verified (N)	24.975 (4629)	23.761 (2947)	27.102 (1682)

Source: Own elaboration from the information included in InsideAribnb.com

versus 23.76 euros). Hosts with verified identification in the digital platform usually benefit from premium prices because guests perceive this verification as a quality indication (Ert et al, 2016). Consequently, non-professional hosts are able to capitalize on a good reputation (Gutt et al., 2015; Wang & Nicolau, 2017, Teubner et al, 2017), because consumers’ responsiveness to this hosts attribute is meaningful. In fact, online reputation is also gaining importance over the traditional star rating even for hotel industry (Abrate & Viglia, 2016).

However, in the subsample of professional hosts the differences in prices are not statistically significant according to the identity verification.

To build a trusted environment for the marketplace, Airbnb tries to reinforce reliability of users, both guests and hosts, through strategies based on the reputation of the accommodations. Consequently, Airbnb has defined a system of reviews and assessments on different characteristics of the accommodations. The company needs not only to engage users of the digital platform; it also requires the establishment of trust as a condition for transactions to take place. From this rating system, we have inferred the users’ assessment about the following aspects connected with the accommodation:

- About the accuracy of the information provided in the marketplace (“Accuracy”)
- About the cleaning conditions (“Cleanliness”)
- About the register policy (“Check-in”)
- About the connectivity options (“Communication”), and
- About the location (“Location”)

The results demonstrate that these evaluations are very high: in all cases they are clearly above 9 in a scale from 1 to 10. Moreover, differences between professional and non-professional hosts are irrelevant.

Impact of Location on Prices

The position of lodgings plays a crucial role to justify the observed differences in prices. In Table 8 discernible divergences do exist among the different urban districts. With the exception of Sarrià-SantGervasi (the neighbourhood with the highest per capita income in the city), the most central districts (Ciutat Vella, Eixample and Gràcia) show the uppermost price per accommodate. Ciutat Vella is providing a wide sample of tourist resources closely related to historic heritage, while Eixample and Gràcia are quarters in which tourists can find most of tourist amenities and buildings connected with the art movement of modernism in Barcelona.

These urban districts are also the sites where most of accommodations are located (62.9%). Regarding to the perceived quality of guests, all the different dimensions obtain top results, bigger than 9 points,

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Table 7. Mean value of the quality dimensions by host type.

	Non-Professional	Professional	Total
Accuracy	9.47	9.10	9.33
Cleanliness	9.25	9.02	9.16
Check-in	9.68	9.38	9.57
Communication	9.64	9.34	9.53
Location	9.55	9.38	9.49

Source: Own elaboration from the information included in InsideAribnb.com

with the exception of lodgings placed in Horta-Guinardó, Nou Barris and Sant Andreu, all of them peripheral districts. In these cases, the guests' evaluation of location is slightly inferior. As far as the accommodation move away from tourist amenities, the lower is its price. Contextual factors, as the location of the hospitality service, appear to be of paramount importance in terms of attractiveness for demand.

Although central districts are those with highest prices of rental accommodation, we should isolate the influence of the characteristics of the different lodgings to corroborate if central location, closest to the main tourist amenities, is the most determining factor of the price-making process in this digital platform.

Therefore, a discriminatory analysis is developed to find out if the variables associated with the price, related to the main characteristics of properties and previously identified and analysed in Table 5, or if the variables connected with the subjective valuations of users about the quality of lodgings and services (described in Table 7) permit the identification of the housing location. To perform this analysis, we define a new variable "City center": it takes value 1 in the case the offer is placed in one of the central districts (Ciutat Vella, Eixample or Gràcia) and 0 in the other cases.

The rate of success in the discriminant analysis is 59.16%. The results show that, for the whole tested variables, the highest differences in the mean values are those related to the characteristics of this kind of rental accommodations. This is the consequence of the lower size of lodgings located in the downtown

Table 8. Price per accommodate and quality perception for each urban district

Urban District	N	Price	Accuracy	Cleanliness	Checkin	Communication	Location
Ciutat Vella	1649	26.56	9.27	9.01	9.52	9.51	9.71
Eixample	2088	25.86	9.34	9.20	9.57	9.53	9.62
Gràcia	603	25.82	9.43	9.24	9.60	9.56	9.49
Horta-Guinardó	259	21.14	9.46	9.31	9.64	9.59	8.97
Les Corts	147	20.22	9.37	9.24	9.59	9.50	9.35
Nou Barris	99	17.61	9.41	9.15	9.65	9.58	8.77
Sant Andreu	138	19.67	9.25	9.12	9.55	9.38	8.99
Sant Martí	874	23.76	9.31	9.20	9.58	9.53	9.23
Sants-Montjuïc	836	23.74	9.40	9.24	9.60	9.55	9.40
Sarrià -Sant Gervasi	197	30.79	9.31	9.15	9.51	9.45	9.32
Total	6890	25.10	9.34	9.16	9.57	9.53	9.49

Source: Own elaboration from the information included in InsideAribnb.com

Table 9. Discriminant analysis of rental prices according to location

	Groups Mean		Discriminant Function
	No City Center	City Center	Coefficients
Accommodates	2.95	2.74	0.186
Bathrooms	1.25	1.19	0.296
Bedrooms	1.36	1.33	0.119
Beds	1.96	1.76	0.353
Accuracy	9.33	9.34	-0.212
Cleanliness	9.13	9.18	-0.296
Check-in	9.55	9.59	-0.113
Communication	9.50	9.54	-0.104
Location	9.46	9.51	-0.351

Source: Own elaboration from the information included in InsideAribnb.com

of Barcelona. Regarding to the valuations of users, we can observe that generally all the mean values are bigger in the case of lodgings placed in central districts. However, differences are not remarkable.

The Role of Professional Hosts

It has been shown that Airbnb’s business in the city of Barcelona is essentially located in the central districts. Within these areas the concentration of supply is much higher because the rental activity is generally more profitable. Although the digital platform aspires to be recognized as part of the sharing economy universe, the fact is that this geographic deployment entails a direct and intense competition with the local hotel industry, also mainly located in the places with major tourist amenities. As Oskam and Boswijk (2016) point out, the company seems to act in Barcelona as a business-oriented and profit-searching digital platform, which means that the company would clearly enter into the field of network capitalism, based on hyperconnected and distributed platforms that have a clear commercial objective.

Significantly, not only private individuals are attracted to this marketplace to supply tourist rental accommodation. Many intermediaries and other players from the real state and tourism industries are taking advantage of the digital platform to expand their business opportunities and to optimize the returns and profitability of their properties portfolio. As a consequence, the platform could be hosting commercial networking activities that do not strictly fit nor with the business models based on P2P nor with the intrinsic constitution of collaborative consumption (Ke, 2017).

These professional hosts could be aggravating the observed concentration of tourist rental accommodation activities in the downtown of the city. A two-step analysis has been carried out to analyse the commercial functioning of these multiple hosts.

First, a contingency table has been calculated from centrality of location. We obtain results that confirm that the location and the fact of being a professional host are independent variables (Chi-squared = 0.329, p-value = 0.566). Although, most of lodgings in Barcelona are provided for non-commercial purposes (63.0%), both private hosts and professional hosts are distributed in a very similar way between the urban districts. Most of them are clearly located in the downtown (63.1% of accommodations). This

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Table 10. Contingency table between location and type of host

	Non-Professional Hosts	Professional Hosts	Total
Non-central	23.1%	13.8%	36.9%
Central	39.9%	23.2%	63.1%
Total	63.0%	37.0%	100.0%

Source: Own elaboration from the information included in InsideAribnb.com

distribution manifestly puts pressure on the local hotel industry and the level of rents for residents, at least in this area of the city.

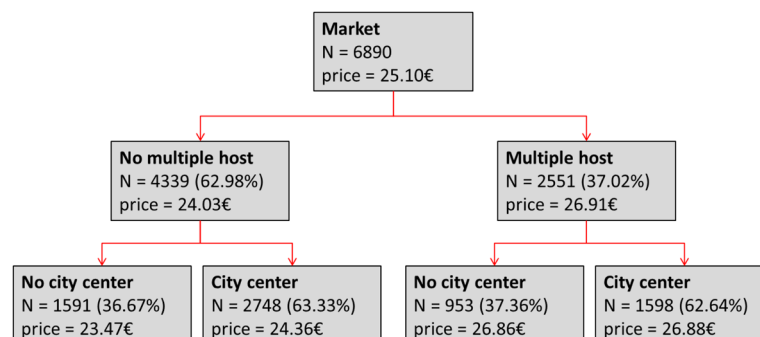
Second, a dependence analysis is also provided. We investigate the link between the variables price, location and type of host using the methodology of automatic detection of interactions. Results show that professionalization clearly has a more determining influence on prices than location. So, although the mean price in the city center is visibly superior to accommodations placed in the other districts, it can be seen that there is a much higher difference between the average price of non-professional hosts and the rental price of accommodations provided by hosts with multiple lodgings. Consequently, the stress on rental prices for residents in the downtown of Barcelona would seem to be closely related with the central location of many tourist accommodation facilities but even much more with the presence in the digital marketplace of professional hosts.

Therefore, localization and professionalization of the supply of rental accommodation for tourism in Barcelona using Airbnb are two distinctive elements with a potentially disruptive impact in the business model of the incumbent industry that claim for an appropriate regulation. In particular, it becomes clear from our analysis that professionalization plays an important role as a determinant of price. However, pure utilitarian or economic motivations do not necessarily have to be considered as solely negative aspects and perhaps users with different motivations for participating could coincide in the digital platform in mutual beneficial ways (Hamari et al, 2016).

As a consequence, Airbnb is providing a disruptive innovation to the market that could be fostering different types of networked hospitality services, in the context of deep societal changes in the use of digital technologies and the preference for different experiences associated with tourism.

Figure 3. Segmentation tree according to host typology and place

Source: Own elaboration from the information included in InsideAribnb.com



The large variety of offerings in the digital platform could also create market segmentation, based on the different consumers' preferences. In fact, hosts would employ marketing rational to target their listings for matching their supply with the predilections of some specific consumer segments and achieving a more efficient outcome (Lutz & Newlands, 2018).

In the database, there are two different types of lodgings related to the level of privacy provided to the users. On the one side, we have the supply of entire homes or apartments, and on the other side, the offer of private or shared rooms. The great majority of accommodations are private or shared rooms, while entire homes or apartments represent just a share of 32%. Since we have tested the relevance of professionalization, we are now interested in knowing its relationship with these two different types of accommodations. The results shown in Table 11 confirm that professionals are more inclined to offer entire homes and apartments in the Airbnb listings, meanwhile most of non-professional hosts in Barcelona provide accommodations in rooms (private or shared). The Chi-squared test show that both variables are not independent (Chi-squared = 535.23, p-value = 0.000).

Price Determinants of Airbnb's Housing Offers

We have already seen in previous sections that the accommodation's characteristics, related to the number of guests (people that can be hosted) or the quality of the accommodation (number of bedrooms, number of bathrooms, and number of beds), are important to explain price determination (see Table 5). However, results also showed that other factors had to be considered in order to improve the level of explained variability (38.7%). Later analyses permitted to discover other reliable candidates to be included in the list of significant factors. Among these factors, professionalization, location and type of housing exhibit the greatest potential to increase the variability of prices.

With the objective of testing this hypothesis, we include these three variables in the initial regression proposed in subsection II.II. Results in Table 12 prove that the inclusion of the new variables rise up the level of variance explained (41.1%). Individual significance analyses show that all variables are relevant except for "City center": while all p-values are clearly lower than 0.05, its p-value exceeds this bound. Again, professionalization emerges as a very significant factor that clearly overcomes the influence of location (as we already discussed in section II.V). Finally, the type of housing, followed by the number of accommodates, becomes the most important factor to explain price forming in the digital platform.

In fact, recent studies reveal that some attributes, as location, amenities or hosts are the most powerful influencers on Airbnb users' experiences, even surpassing the effect of rental prices (Mingming & Xin, 2019).

Table 11. Contingency table between housing types and host types

	Non-Professional Hosts	Professional Hosts	Total
Private or shared room	49.2%	18,9%	68,1%
Entire home or apartment	13.8%	18,1%	31,9%
Total	63.0%	37,0%	100.0%

Source: Own elaboration from the information included in InsideAribnb.com

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Table 12. Determining factors of price forming

	Coefficients	s.e.	t	p-Value
Constant	-12.216	2.347	-5.205	0.000
Accommodates	15.415	0.909	16.967	0.000
Bathrooms	10.850	1.681	6.453	0.000
bedrooms	4.797	1.488	3.223	0.001
Beds	3.155	1.080	2.920	0.004
Professional	9.316	1.494	6.237	0.000
Entire home	31.941	2.145	14.894	0.000
City center	0.917	1.414	0.649	0.517
R-squared: 0.411, Adjusted R-squared: 0.411				
F: 686.804, p-value: 0.000				

Source: Own elaboration from the information included in InsideAribnb.com

Demand Side Analysis

In most part of this chapter, we have focused on the offer side. We have examined how the supply side fixes their housing prices, according to different factors related to the house characteristics, privacy, location and the hosts' profile. Although we have already studied in subsection II.III some specific issues concerning the demand side (i.e. the users' perceived quality about accuracy, cleanliness, check-in, communication and location), now we are interested in performing a more comprehensive analysis. We want to know, for example, if there exists a direct relation between offer (price) and demand. In other words, we would like to corroborate if the most demanded accommodations are also the most expensive.

As a proxy to measure the demand for an accommodation we will consider the number of reviews made by the users of that accommodation. In order to get a comparable measure, we will also consider the number of months an accommodation has been listed in Airbnb. Table 13 contains the descriptive statistics of these two variables for each neighbourhood, jointly with the ratio between them.

The mean of reviews received by an accommodation listed in Airbnb is 31.6. We interpret this value as a proxy of the number of times an offer has been hired. Hence, we understand that the more demanded accommodations are those located in the city center (Ciutat Vella, Eixample and Gràcia) and also those placed in Horta-Guinardó, Sant Martí and Sants-Montjuïc. In average, offers in Airbnb have been listed during 19.6 months (approximately one year and a half). This represents that every lodging receives 1.8 reviews each month. In consequence, we consider that each accommodation is hired twice monthly.

Results for each urban district show that although accommodations in Gràcia are listed in average during 2 years (23.8 months), they are hired just 1.6 times each month. This data is clearly below the values obtained in the other two urban districts in the city center, Ciutat Vella and Eixample, which are clearly the most demanded: 2.0 and 1.9 respectively. The characteristics of tourist amenities could determine deeper centralities inside the city center. On the contrary, the accommodations located in the peripheral districts (as Les Corts, Sarrià-Sant Gervasi or Nou Barris) are the less demanded: 1.4-1.5 times each month.

The frequency analysis of the variable *number of reviews* shows that one third of the accommodations (33.3%) have received 5 or less reviews, meaning that they have had a very low demand among users.

Table 13. Mean value of the demand indicators for each urban district

Urban District	Number of Reviews	Moths Listed	Reviews per Month
Ciutat Vella	29.82	17.13	2.00
Eixample	33.71	20.26	1.89
Gràcia	35.95	23.77	1.60
Horta-Guinardó	30.65	18.74	1.82
Les Corts	21.05	18.09	1.42
Nou Barris	20.60	14.36	1.57
Sant Andreu	21.90	15.45	1.64
Sant Martí	29.89	20.46	1.76
Sants-Montjuïc	34.86	20.45	1.79
Sarrià-Sant Gervasi	26.53	21.22	1.52
Total	31.62	19.61	1.83

Source: Own elaboration from the information included in InsideAribnb.com

This low interest cannot be attributed to the location (these low demanded accommodations have around 2.5 reviews in average in all urban districts) nor is the consequence of the assessment process, because all dimensions obtain a very satisfactory value in the reviews (greater than nine). In our opinion, this scarce demand could probably be associated with to two other different factors:

- First, these low required accommodations have been listed recently, compared with the rest of the sample. In average, the low demanded accommodations have been offered during almost one year (10.9 months), whereas the other lodgings double this data (23.9 months). Accommodations need time in the market, a high rotation and a significant number of reviews to become more appealing for demand.
- Second, their average price per accommodate is higher than the average price of those accommodations with more than 5 reviews (26.6€ and 24.3€, respectively). This result makes clear the existence of an inverse effect between price and demand for these unconventional accommodation offers.

In fact the correlation analysis between price per accommodate and number of reviews (per month) confirms this suggested relationship: the Pearson correlation between them equals -0.14, with a p-value of 0.000. Although Airbnb does not focus on a single target group of users and the digital marketplace is segmented by the different qualities, amenities and location of properties, we can also verify that the most demanded rental accommodations for tourism and vacation in Barcelona are also the lodgings and homes with the lowest prices. This attribute would be providing the higher contribution to consumers' utility because tourists' satisfaction does not seem to critically depend on location.

CONCLUSION

In the hospitality business, Airbnb is becoming a direct rival for hotel industry and also a powerful driver for change. The digital platform is coordinating the demand and supply of tourist products and services that were previously unavailable on the market. But Airbnb's activities are also challenging many different policies, regulations and objectives of local governments, with the evolution of rents and the displacement of resident population from the central districts as the main concerns among policy-makers.

We have analysed one of the most populated destinations for tourism and leisure in the Mediterranean region, which also observed a dramatic increase in the number of listings offered in the digital platform. A great deal of information is revealed using Barcelona as a city lab. Our research provides some preliminary findings.

First, the identification of the digital marketplace as merely a P2P network that empowers individual consumers is clearly in question. Although transactions may be used for mutual benefit, the commercial intentions are undoubtedly present in the front line. The extractive nature seems to prevail over the collaborative consumption process. Significantly, the platform is attracting a growing number of multi-hosting players with an obvious commercial purpose. Airbnb would actually be more like a rental marketplace rather than a spare-room sharing platform. And, as home sharing is both a personal and a commercial enterprise, it should be appropriately regulated and taxed.

Second, the geographical distribution of the tourist rental accommodations included in the digital marketplace prevents Airbnb from playing a complementary role of the hotel industry. The patterns of distribution of lodgings in the city are very similar. Therefore, although the users of the platform benefit from a greater flexibility and favourable economic conditions, the emergence of negative externalities cannot be fully rejected. This networked hospitality business intensifies the stress of tourism on the level of rents and the supply of services in the central districts of the city.

Third, in Barcelona nearly 40% of the listing is in the hands of professional hosts. These agents seem to exercise a decisive influence on the evolution of rents in Barcelona, essentially due to their disproportionately high participation in the supply of entire homes and of accommodations located in central districts.

Fourth, Airbnb's efforts to build a reliable environment and to promote self-regulation policies are not only in the interest of protecting the users of the platform but of avoiding a direct negotiation and also inspiring trust, a critical condition for transitions to take place. This method needs the involvement of guests and seeks the profound complicity of hosts, because they are able to capitalize on the reputational dimension by means of higher prices.

Fifth, rental prices in Barcelona for tourist accommodation obviously depend on the quality and characteristics of the lodgings and their physical distance to the main tourist amenities but also of hosts' attributes. Clearly, contextual and reputational factors play a relevant role in the evolution of prices.

Finally, looking to the demand side, the analysis clearly confirms that both location and prices are the main determining factors for the selection of the accommodations services provided by the platform. The influence of these factors is probably very significant also for the local hotel industry. However, pricing is running the dominant segment of the sharing economy based market for rental tourism accommodation in Barcelona. As expected, the fast-growing supply of lodgings with affordable prices has decisively spurred the demand for short-term rental services in the digital marketplace.

In addition, more transparency should be demanded to the digital platform about hosts and properties, to properly identify commercial parties for preventing an excessive economic exploitation and some

negative externalities on the domestic rental market. In particular, the upward trend to repurpose and reuse residential housing exclusively as tourist accommodation in Barcelona should be reverted.

The study has an important limitation. The effect of amenities and rental rules on prices has not been yet tested. Probably, some services provided by hosts and the degree of flexibility in accommodation rules could have a significant impact on prices. In addition, although this is not the specific aim of this research, the study does not focus on the demand side of the marketplace. Probably, some attributes of Airbnb's consumers could also influence the price of transactions.

REFERENCES

- Abrate, G., & And Viglia, G. (2016). Strategic and tactical price decisions in hotel revenue management. *Tourism Management*, 55, 123–132. doi:10.1016/j.tourman.2016.02.006
- Airbnb. (2013). *New study: Airbnb community contributes \$175 million to Barcelona's economy*. Available at: www.airbnb.nl/press/news/new-study-airbnb-community-contributes-175million-to-barcelona-s-economy
- Arias Sans, A. (2015). *Desmuntant Airbnb. Apunts crítics sobre el cas de Barcelona*. Available at: <http://latramaubana.net/2015/07/01/desmuntant-airbnb-apunts-critics-sobre-el-cas-de-barcelona/#more-1245>
- Belk, R. (2014). Sharing Versus Pseudo-Sharing in Web 2.0. *Anthropologist*, 18(1), 7–23. doi:10.1080/09720073.2014.11891518
- Botsman, R., & Rogers, R. (2011). *What's Mine is Yours. How Collaborative Consumption is Changing the Way We Live*. London: Harper Collins.
- Croft, A. (2015). Airbnb remains symbol of Barcelona's growing unease with tourism. *Skift*. Available at: <http://skift.com/2015/08/26/airbnb-remains-symbol-of-barcelonas-growing-unease-withtourism/>
- Dredge, D., Gyimothy, S., Birkbak, A., Jensen, T. E., & Maqdsen, A. K. (2016). The impact of regulatory approaches targeting collaborative economy in the tourism accommodation sector: Barcelona, Berlin, Amsterdam and Paris. Impulse Paper, 9. Aalborg University.
- Dredge, D. i S., & Gyimóthy, S. (2015). The collaborative economy and tourism: Critical perspectives, questionable claims and silenced voices. *Tourism Recreation Research*, 40(3), 286–302. doi:10.1080/02508281.2015.1086076
- Eisenmann, T., Parker, G., & Alstyne, V. W. (2006). Strategies for two-sided markets. *Harvard Business Review*, 84(10).
- Ert, E., Fleischer, A., & Magen, N. (2016). Trust and Reputation in the Sharing Economy: The Role of Personal Photos on Airbnb. *Tourism Management*, 55, 62–71. doi:10.1016/j.tourman.2016.01.013
- España, E. Y. (2015). *Impactos derivados del exponencial crecimiento de los alojamientos turísticos en viviendas de alquiler en España, impulsado por los modelos y plataformas de comercialización*. Madrid: Exceltur.

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Finley, K. (2013). *Trust in the Sharing Economy: An Exploratory Study*. Warwick, RI: Centre for Cultural Policy Studies, University of Warwick.

Gutt, D., & Herrmann, P. (2015). *Sharing Means Caring? Hosts' Price Reaction to Rating Visibility*. ECIS 2015 Research-in-Progress Papers. Paper 54.

Guttentag, D. (2013). Airbnb: Disruptive innovation and the rise of an informal tourism accommodation sector. *Current Issues in Tourism*, 1–26.

Hamari, J., Sjöklint, M., & Ukkonen, A. (2016). The sharing economy: Why people participate in collaborative consumption. *Journal of the Association for Information Science and Technology*, 67(9), 2047–2059. doi:10.1002/asi.23552

Horn, K., & And Merante, M. (2017). Is home sharing driving up rents? Evidence from Airbnb in Boston. *Journal of Housing Economics*, 38, 14–24. doi:10.1016/j.jhe.2017.08.002

Ikkala, T., & Lampinen, A. (2015). Monetizing network hospitality: hospitality and sociability in the context of Airbnb. *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing*, 1033-44. 10.1145/2675133.2675274

Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons*, 53(1), 59–68. doi:10.1016/j.bushor.2009.09.003

Ke, Q. (2017). *Sharing Means Renting?: An Entire-marketplace Analysis of Airbnb*. Cornell University. *Proceedings of the ACM on Web Science Conference*, 131-139.

Lehr, D. D. (2015). *An analysis of the changing competitive landscape in the hotel industry regarding Airbnb* (Master thesis). Dominican University of California, San Rafael, CA.

Li, J., Moreno, A., & Zhang, D. J. (2015). *Agent behavior in the sharing economy: evidence from Airbnb*. Working Paper 1298, Ross School of Business, University of Michigan.

Liang, Choi, & Joppe. (2017). Understanding repurchase intention of Airbnb consumers: perceived authenticity, electronic word-of-mouth, and price sensitivity. *Journal of Travel & Tourism Marketing*. doi:10.1080/10548408.2016.1224750

Lutz, C., & Newlands, G. (2018). Consumer segmentation within the sharing economy: The case of Airbnb. *Journal of Business Research*, 88, 187–196. doi:10.1016/j.jbusres.2018.03.019

Martin, C. J. (2016). The sharing economy: A pathway to sustainability or a nightmarish form of neo-liberal capitalism? *Ecological Economics*, 121, 149–159. doi:10.1016/j.ecolecon.2015.11.027

Mingming, C., & Xin, J. (n.d.). What do Airbnb users care about? An analysis of online review comments. *International Journal of Hospitality Management*, 76, 58–70.

Oskam, J., & Boswijk, A. (2016). Airbnb: The future of networked hospitality businesses. *Journal of Tourism Futures*, 2(1), 22–42. doi:10.1108/JTF-11-2015-0048

Quijones, D. (2015). Barcelona just declared war on Airbnb. *Business Insider*. Available at: www.businessinsider.com/barcelona-just-declared-war-on-airbnb-2015-8

- Richardson, L. (2015). Performing the sharing economy. *Geoforum*, 67, 121–129. doi:10.1016/j.geoforum.2015.11.004
- Riegelsberger, J., Sassei, M. A., & McCarthy, J. D. (2005). The mechanics of trust: A framework for research design. *International Journal of Human-Computer Studies*, 62(3), 381–422. doi:10.1016/j.ijhcs.2005.01.001
- Teubner, T., Hawlitschek, F., & Dann, D. (2017). Price Determinants on Airbnb: How Reputation Pays Off in the Sharing Economy. *Journal of Self-Governance and Management Economics*, 5(4), 53–80. doi:10.22381/JSME5420173
- Wachsmuth, D., & Weisler, A. (2018). Airbnb and the Rent Gap: Gentrification Through the Sharing Economy. *Environment and Planning A: Economy and Space*, 50(6).
- Wang, D., & Nicolau, J. L. (2017). Price determinants of sharing economy based accommodation rental: A study of listings from 33 cities on Airbnb.com. *International Journal of Hospitality Management*, 62, 120–131. doi:10.1016/j.ijhm.2016.12.007
- Zervas, G., Proserpio, D., & Byers, J. (2017). The Rise of the Sharing Economy: Estimating the Impact of Airbnb on the Hotel Industry. *JMR, Journal of Marketing Research*, 54(5), 687–705. doi:10.1509/jmr.15.0204
- Zhang, Z., Chen, R. J. C., Han, L. D., & Yang, L. (2017). Key Factors Affecting the Price of Airbnb Listings: A Geographically Weighted Approach. *Sustainability*, 9(1635).