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## Profiling of Airbnb's activities in Ecuador's main cities

### Abstract

Airbnb in Ecuador is a platform offering since 2008 a new lodging concept that best can be described as a *sharing economy model* through the rental of private rooms and apartments. The article provides an overview of Airbnb's activities in Ecuador, more in particular in 22 cities, respectively the capitals of 22 provinces, using the 16 metrics available on the platform of AirDNA. Factor analysis was applied to reduce the number of variables to three main surrogate variables (lodging typology, prices and rates, market metrics) that characterizes Airbnb and retains the original factor variability. Additionally, based on the occupation frequency of Airbnb's rental places the cluster analysis permitted to group the cities in which Airbnb is active on the basis of the following indicators: amazon destinations, traditions, sun and beach, nature culture and events, and the country's capital. The research provided a clear image of Airbnb's approach and impact on the formal accommodation sector, which ultimately will enable the sector to come up with innovative products to compete more efficiently Airbnb's market range.

**Key words:** Airbnb; AirDNA; accommodation; tourism; Ecuador

### 1. Introduction

Currently Airbnb provides accommodation in more than six million unique places, in 81,000 cities and 191 countries. Since its creation it has lodged more than 500 million people and can account on an average of 2 million customers per night (Airbnb, 2019). Since its launch in 2008, Airbnb has become one of the world's largest tourist accommodation distribution platforms. The main advantage of the sharing economy model (Xie & Kwok, 2017) of Airbnb is that it integrates local communities for the housing of tourists (Londoño & Medina, 2018). In this way, companies like Airbnb provide substantial financial, economic, and social resources, and benefits for the communities in which they operate (Dogru, Modu, & Suess, 2019). The exponential growth turned Airbnb into an alternative form of accommodation with global implications (Gibbs et al., 2018).

Given the disruptive character of Airbnb it is relevant for the formal tourist sector, in particular the accommodation sector, to examine the pressing challenges created by Airbnb's business model that offers tourists the rental services of houses, apartments, among other facilities, and to search for ways to stabilize and enhance the attractivity of the classic accommodation sector (Guttentag, 2015). Also, Yoonjung Heo, Blal and Choi (2019) suggested that more research is needed to examine in greater detail the advantages and disadvantages of Airbnb's concept to better understand the true impact of the sharing accommodation concept on the hospitality landscape.

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Whereas quite some research focused on the distribution and characteristics of Airbnb's activities in Europe, North America and Asia (Adamiak, 2018; DiNatale et al., 2018; Yoonjoung Heo et al., 2019), in contrast only few studies analyzed Airbnb's activities in Latin America, and particular in Ecuador. Related to this, our research aimed to draw a more detailed picture of the specific characteristics of Airbnb's activities in Ecuador, more in particular how Airbnb is making use of the community market in 22 provincial cities. For the analysis we used Airbnb's indicators characterizing the lodging activities, information available on the AirDNA platform. Subsequently, we subjected the information to a factor and cluster analysis to diagnosis, based on Airbnb's customers, the main attraction factors of Ecuador's tourist destinations and to group on this the 22 cities. The manuscript encompasses respectively the description of the used research methodology, the presentation of the results, and the discussion of findings and conclusions.

## 2. Literature review

The introduction of disruptive innovations, such as Airbnb, generated important changes in the market and in companies' strategic positioning (Viglia, Werthner, & Buhalis, 2016), and showed that a smaller company with fewer resources is able of successfully challenge established companies (Christensen, Raynor, & McDonald, 2015). In this way, disruptive innovation is defined as that what affects established markets and dominant companies through the introduction of a new and creative way of operating or by offering new products or services (Christensen & Overdorf, 2000). Christensen (1997, p. 11) describes disruptive technologies as those that displace existing technologies and/or introduce ground-breaking products that ultimately might lead to the creation of new industrial developments. Disruptive products tend to be in general cheaper, simpler, smaller, and often more convenient to use. In addition, disruptive innovations seem to possess the power to penetrate markets (Bower & Christensen, 1995).

In this sense, the tourism industry is changing rapidly, the way customers and providers communicate has evolved. The new nexus of union are information technologies, and the future is to understand the evolution that these technologies are undergoing (Ruiz Gómez, Rodríguez Fernández, & Navio-Marco, 2018). The hosting platforms offer the end users a comprehensive range, significant discounts and dynamic packages (Ban & Popa, 2015).

The innovative element of Airbnb is the offering via Internet of short- to long-term lodging to tourists (Lorde, Jacob, & Weekes, 2019) sharing at low cost private rooms, apartments or homes, randomly available in the society. Airbnb's sharing model is disruptive compared to the classical way tourist have been lodged in hotels, a system applied for decades (Guttentag, 2015). The quotation of "disruptive innovation" is in line with Schumpeter's (1942) concept of "creative destruction", that refers to the process of how capitalism leads to a constantly changing structure of the economy; i.e. non profitable economic activities close-down and the released resources are invested in new developments.

As stated by Gunter and Önder (2017) is the capitalist business model a main driver of innovation. Similarly, the decline of the hotel sector resulted into the emergence of Airbnb, putting the classical accommodation sector even further under pressure.

As to better understand Airbnb's renting concept of accommodation to tourists, in the following a brief description is given of the activities of this accommodation platform in Europe and other parts of the world.

According to Adamiak (2018) consists Airbnb's economic activities in Europe mainly in offering to tourists' accommodation in private houses, and the followed approach is city dependent. In relative

non-tourist cities, the service mainly consists in the renting of rooms in private homes; in main tourist destinations, it consists in the renting of houses and apartments exclusively for tourism purposes. The platform facilitates connections between hosts who rent spaces in their homes or secondary properties and people around the world who are interested in these services (Lampinen & Cheshire, 2016). Some hosts reside in their properties while providing the hosting service, some are temporarily absent, and others manage permanent businesses (Guttentag, 2015). DiNatale, Lewis and Parker (2018) pointed out that Airbnb per definition provides accommodation in different types of properties such as: houses, apartments, villas, tents, among others, which are offered under three categories: entire house, private room, and shared room. The structure of the Airbnb's offer varies and depends on several factors related to the destination. This is especially the case of destinations that face the challenge of assimilating a transformative and coherent position with current demands (Cruz & Pulido-Fernández, 2012).

Another feature that makes Airbnb popular is the overall low accommodation price compared to hotels. Airbnb occupies a unique position in the sharing economy, because property owners can establish daily, weekly, and monthly rates, and control prices over time (Gibbs et al., 2018). Thus, Airbnb's success is due to its affordable prices, which attract a large flow of consumers to use this type of accommodation (Tussyadiah & Pesonen, 2016). In addition, hosts reset or modify prices and decide how much they want to charge and when they want to adjust the price based on their own observations, personal judgments, and the accommodations' physical attributes (Xie & Kwok, 2017); whether they rent a complete house or a single room (Pérez-Sánchez et al., 2018). Blal, Singal and Templin (2018) argue that the higher the prices of Airbnb rentals at their destinations, the higher the demand for their rooms. Moreover, if they adjust their prices frequently, they could exceed others in the Revenue Per Available Room (RevPAR) (Oskam, van der Rest, & Telkamp, 2018). Perez-Sanchez, Serrano-Estrada, Marti and Mora-Garcia (2018) consider that Airbnb's accommodation price is driven by the lodging's physical characteristics, the user's perception, and its location; hosts are able to establish the right price at the right time in order to maximize their income (Guttentag & Smith, 2017; Wang & Nicolau, 2017).

Regarding occupancy rate, more than 60 million overnight stays have been reserved in Airbnb establishments since this platform began to provide its services (Aznar, Sayeras, Rocafort, & Galiana, 2016). As an example, in Prague in the period 2016-2017 varied the average number of accommodation units offered between 8 and 12 thousand per day and the average occupancy rate fluctuated around 50.21%. In the same period, 18,548 accommodations were offered in Prague through the Airbnb platform, of which 75.04% were used at least once (Ključnikov, Krajčičk, & Vincúrová, 2018). Coyle and Yeung (2016) conducted a study on Airbnb in 14 European cities and found that during the 2015-2016 period the average occupancy rate was around 30%, a rate significantly influenced by seasonal fluctuations in demand. In cities like Paris, the occupancy rate ranged between 50% and 55% during the period 2009-2015, which showed a marked seasonality, so there was a significant fluctuation in the occupancy rate throughout the high season (March - July) and the low season (August - February) (Heo, Blal, & Choi, 2019).

Zervas, Proserpio and Byers (2015) conducted an analysis of the scores received by more than 600,000 properties listed on Airbnb around the world. The authors indicate that almost 95% of the properties received an average rating by the user of 4.5 to 5 stars. It is estimated that 70% of the guests who used Airbnb's service wrote a positive review about their experience (Lawani, Reed, Mark, & Zheng, 2018). Furthermore, Wang and Jeong (2018) indicated that Airbnb's share in accommodation will further expand the more inventive consumers in future will be, Airbnb's website is more reliable and user-friendly, and provides in addition more detailed and useful tourist information. All signals indicate that Airbnb is a good lodging option, apart from representing 5% of the income for worldwide

tourist accommodation (Gibbs et al., 2018). Last but not least, Airbnb stimulates locals to become more entrepreneurial by putting fraction of their property available for the lodging of tourists and by the creation of additional jobs, such as maintenance, renovation of property, etc. (Lu & Tabari, 2019).

### 3. Materials and methods

#### 3.1. Sample and data

The accessible population of the research consisted of Airbnb's accommodations in 22 provincial capitals of Ecuador. Table 1 presents the characteristics of the sample, consisting of 9,825 active<sup>1</sup> Airbnb accommodations available during the study period (November 2018). The month of November was chosen for the four-day national holiday in this month and that encourages domestic and inbound tourism. The provincial capitals were chosen because they are the main tourist destinations of the country, in addition, the selected markets are representative for the four main regions of the country (the coast, the Andes, Amazon and the Galapagos Islands). The capitals of the provinces of Carchi and Pastaza were not included due to missing data on the AirDNA platform. The accommodations in this period via internet announced by Airbnb consisted of apartments, aparthotels, bungalows, cabins, houses, cottages, guest houses, beach houses, tourist complexes, condominiums, apartments, farms, rooms, ranches, hotels, hostels, tents, residences, villas, ecological inns, lofts, penthouses, and suites.

Table 1  
Characteristics of Airbnb's accommodation and tourist aspects in Ecuador's main cities in the period September-December 2018

Province <sup>2</sup>	Capital <sup>3</sup>	No. Airbnb	Km <sup>2</sup>	Population	Cultural resources <sup>4</sup>		Natural resources <sup>5</sup>	Access <sup>6</sup>
					Heritage assets	Museums		
Azuay	Cuenca	977	3,665.33	505,585	12,074	20	4	2
Bolívar	Guaranda	23	1,892.09	91,877	801	2	2	0
Cañar	Azogues	17	379.95	70,064	825	5	2	0
Chimborazo	Riobamba	117	979.70	225,741	3,734	7	2	1
Cotopaxi	Latacunga	75	1,386.30	170,489	1,328	3	2	2
El Oro	Machala	34	372.75	245,972	603	3	2	0
Esmeraldas	Esmeraldas	29	1,338.67	189,504	304	2	1	2
Galápagos	Galápagos	502	525.08	25,124	179	0	5	2
Guayas	Guayaquil	1,287	6,027.05	2,350,915	11,530	9	5	4
Imbabura	Ibarra	190	1,162.22	181,175	3,404	6	2	1
Loja	Loja	253	1,569.11	214,855	1,995	8	3	1
Los Ríos	Quevedo	13	84.61	173,575	142	2	2	0
Manabí	Portoviejo	111	954.90	280,029	381	13	2	0
Morona Santiago	Morona	15	4,654.48	41,155	138	3	2	1
Napo	Tena	102	3,918.09	60,880	107	2	1	3
Orellana	Orellana	10	7,047.03	72,795	72	2	1	1
Pichincha	Quito	6,044	4,223.00	2,239,191	21,271	62	5	2
Santa Elena	La Libertad	44	25.60	95,942	148	3	1	1
Santo Domingo de los Tsáchilas	Santo Domingo	72	3,532.00	308,013	146	1	1	0
Sucumbios	Lago Agrio	24	3,143.21	91,744	81	1	2	0
Tungurahua	Ambato	113	1,116.45	329,856	2,109	12	2	1
Zamora Chinchipe	Zamora	12	1,872.00	25,510	285	0	1	1

Source: Instituto Nacional de Estadísticas y Censos del Ecuador (2010), Instituto Nacional de Patrimonio Cultural del Ecuador (2018), Ministerio de Cultura y Patrimonio del Ecuador (2018), Ministerio del Ambiente del Ecuador (2019).

Table 2 summarizes the descriptive statistics characterizing Airbnb's accommodation offer<sup>7</sup> in the 22 provincial capitals. The AirDNA's database includes indicators within the categories: pricing, occupancy, seasonality, revenue, guests, rates, and top properties of tourist destinations. From the database 16 variables were analyzed of the 22 provincial capitals. The table reveals that for the month November 2018 the average daily rate of accommodation (ADR) was equal to \$42.50, the average occupancy rate 21.77%, the average revenue per available room (RevPAR) during the week \$18.32 and \$22.68 in the weekend. The number of accommodations per type was equal to 22 for super-host establishments, 57 for multi-listing hosts establishments, 279 for single-listing hosts. The average rental demand score for November 2018 was 25.89, and the average number of properties booked amounted to 146 establishments. Table 2 further shows that for the given period the average number of guests arriving at Airbnb establishments was 236, and the average number of weekly visits to the platform 69. The average rating was 4.51 out of 5.0. Furthermore, the average price of an entire house was \$42.91 and a private room \$18.23. In total, for the 22 provincial cities were 187 houses and 245 private rooms rented. Appendix 1 provides a complete description of the study variables.

Table 2  
Descriptive statistics of Airbnb's accommodation variables

Variables	Mean	SD	Min	Max
V1. Average daily rate	42.50	25.35	12.0	115
V2. Occupancy rate percentage	21.77	13.10	3.0	56
V3. Revenue per available room- RevPAR	18.32	11.25	1.0	50
V4. Weekend revenue per available room –Weekend RevPAR	22.68	15.63	2.0	70
V5. Superhosts	22.00	60.15	0.0	276
V6. Multi-listing hosts	57.00	147.90	0.0	681
V7. Single-listing hosts	279.00	855.34	8.0	4,028
V8. Rental demand	25.89	11.14	1.0	54
V9. Booked properties	146.00	350.64	2.0	1,546
V10. Guest arrivals	236.00	547.70	0.0	2,379
V11. Average weekly views	69.38	51.50	0.0	134
V12. Average rating	4.51	0.27	3.9	5.0
V13. Pricing entire home	42.91	25.49	13.0	116
V14. Pricing private room	18.23	9.53	0.0	44
V15. Entire home	187.00	525.30	2.0	2,240
V16. Private rooms	245.00	699.33	2.0	3,289

Source: AirDNA (2018) (<https://www.airdna.co/>)

### 3.2. Methodology

The study presents a descriptive, cross country analysis of Airbnb's activities in a single period of time, with main goal description of the relationship among a set of  $k$  observable variables with a smaller number of unobservable variables, called factors. Factor analysis works very well when the variables under study are highly correlated and the aim to group the variables based on a limited set of extracted factors. For instance, if all the variables in one group are highly correlated among themselves and have little correlation with the variables in the remaining groups, each group can represent a factor (Alkarkhi & Alqaraghuli, 2019, p. 143). For the analytical verification of the variables in the factor analysis, the Kaiser-Meyer-Okin test (KMO) was used, which indicates that a KMO greater than 0.7 is indicative of high intercorrelation and, therefore, indicative that the factor analysis is a useful technique. Between 0.5 and 0.6 is the degree of intercorrelation medium and the factor analysis would be less useful than in previous case, but applicable; a KMO <0.5 would indicate that it would not be a useful technique

(Alvarez, 1995, p. 244). In the latter case, the Barlett's sphericity test was applied, indicating that a factor analysis makes sense if the null hypothesis that the correlation matrix is an identity matrix is rejected; meaning that the correlations between the variables are all equal to zero (Alvarez, 1995) (Table 3). Then, an ANOVA analysis was performed to determine the existence of significant differences between the groups (Table 4). Once the main factors were identified that explains the people's and tourists' preference of visiting a given city, a cluster analysis was applied that allowed the classification of groups of cases or elements, based on qualitative or quantitative criteria (Alvarez, 1995) (Table 5).

## 4. Findings

### 4.1. Principal components of Airbnb's activities in Ecuador

Airbnb's accommodation platform is characterized in this study by 16 metrics of AirDNA's platform. Using the metric values for the month of November 2018 and by subjecting the data matrix to a principal component and Varimax rotation analysis, 3 principal components explaining 84.75% of the variance were delineated. The Barlett's test of sphericity was applied with a *p*-value of 0.000 and the Kaisen-Meyer-Olkin index (KM0) of 0.684, and both confirmed acceptance of the performed factor analysis. Table 3 shows the results of the factor analysis and the main components characterizing Airbnb's business in Ecuador.

Component 1, called "Type of Accommodation" explains 46.94% of the variance. It integrates the variables of the number of registered establishments and is formed by the number of entire homes, number of private rooms, number of multi-listing hosts, super-host, single host and reserved properties. Component 2, called "Prices and Rates" refers to the prices of the establishments registered in the Airbnb platform and represents 28.20% of the total variance, including variables such as: average daily rate (ADR), the price of the entire house, the price of a private room, and the RevPAR indicator. Component 3, called "Market Metrics", accounts for 9% of the total variance and includes indicators such as guests, average accommodation score, average number of annual views, occupancy ratio, and rental demand. Factor 1 clusters most variables and explains close to 50% of the total variance.

Table 3  
Analysis of main components

Variables	Components		
	Lodging typology	Prices and rates	Market metrics
V15. Entire home	0.982		
V16. Private rooms	0.981		
V6. Multi-listing host	0.981		
V5. Super hosts	0.978		
V7. Single-listing hosts	0.978		
V9. Booked properties	0.967		
V13. Pricing entire home		0.961	
V1. Average daily rate-ADR		0.959	
V3. RevPar		0.891	
V4. RevPar weekend		0.815	
V14. Pricing private room		0.530	
V10. Guest arrivals			0.957
V12. Average rating			0.841
V11. Average weekly views			0.779
V2. Occupancy rate percentage			0.647
V8. Rental demand			0.595

Table 3 Continued

Variables	Components		
	Lodging typology	Prices and rates	Market metrics
KMO (Kaiser-Meyer-Olkin)	0.684		
Bartlett's test of sphericity	Chi squared = 574.183 sig. = 0.000		

Note: VARIMAX Method.

Table 4 shows the results of the one-way analysis of variance (ANOVA) indicating that a significant difference exists between the three unrelated components, delineated in the factor analysis.

Table 4  
Results of the analysis of variance between the main components

Main components	Sum of squares	DF	Mean square	F	Significance
Lodging typology	3.103	5	0.124	25.072	0.000*
Prices and rates	3.080	5	0.133	23.095	0.000*
Market metrics	2.954		0.186	15.894	0.000*

Note: \*p<0.05.

## 4.2 Destination based clustering of Ecuador's provincial cities

Using cluster analysis, 18 of the 22 provincial cities, were classified in 6 groups based on the destination type. In the analysis 4 cities (Esmeraldas, Zamora, Orellana, and Quevedo) were excluded because of their very small share in Airbnb's accommodation offer. Table 5 shows the six groupings as a result of the cluster analysis.

Table 5  
Grouping of 18 provincial cities on the basis of the type of destination

CLUSTER 1 Amazon destinations	CLUSTER 2 Traditional destinations	CLUSTER 3 Sun and beach destinations	CLUSTER 4 Culture and events destination	CLUSTER 5 The capital	CLUSTER 6 Nature destinations
Lago Agrio Morona	Ambato Guaranda Ibarra Latacunga Machala Riobamba Santo Domingo	La Libertad	Cuenca Azogues Loja Guayaquil	Quito	Galápagos Portoviejo Tena

Note: Cluster 1 presents 39 Airbnb lodging sites, cluster 2 (624), cluster 3 (44), cluster 4 (2534), cluster 5 (6044) and cluster 6 (715).

The first cluster called "Amazon Destinations" is composed of Lago Agrio and Morona, constituting a connection into the Amazon jungle to the south as well as to the north of the country. Both cities are visited primarily of their administrative and financial activities. A second cluster is formed by the cities referred to as "Traditional Destinations" formed by Guaranda, Latacunga, Riobamba, Machala, Ibarra, Santo Domingo and Ambato. These destinations are characterized by their high number of heritage assets, their local and national visitors, their traditional festivals and gastronomy, as well as their proximity to natural and community tourist sites. The cities of Guaranda, Latacunga, Riobamba, Ibarra, and Ambato are located in the central-northern region of the Ecuadorian highlands; these cities have important traditions maintained by the different indigenous communities living in this region. They also have natural resources characterized by several important ecosystems; for example, Imbabura has been designed by UNESCO as a World Geopark. Two of these cities are considered as distinct destinations: Machala, which is presented as a cultural destination with its gastronomic heritage, and Santo Domingo, known for the indigenous community of the Tsachilas called "Colorados" which has

maintained its traditions and culture to this day. The third cluster is formed by the city of La Libertad, called "Sun and beach destination". La Libertad has cultural and archaeological attractions as well as its proximity to the different tourist sites that correspond to the Spondylus route, which promotes the attractions of the Ecuadorian coast. The fourth cluster includes Guayaquil, Cuenca, Azogues, and Loja. These cities are located in the south of the country and are called "Culture and Events Destinations" As a Cultural Heritage of Humanity, Cuenca has important natural and cultural resources. Azogues is an administrative center with national government institutions and cultural attractions. Loja is characterized by its cultural resources, artistic expressions, and religious customs. Guayaquil, capital of the province of Guayas and the second most important city in the country, is an administrative and financial center with the addition of cultural and natural resources. Not only is it an important port for the country's commerce, but it is also presented as a business and events destination. Quito, "The Capital," is the first city declared as a World Heritage Site by UNESCO, due to the conservation of its historic center and its architectural and artistic representations. As the capital of Ecuador, it is an administrative and financial center, where the Presidential Palace and the National Assembly are located. Among its important tourist resources are museums, churches, and traditional neighborhoods. Additionally, it has natural resources, such as its volcanoes and natural areas with an important flora and fauna. Cluster six is called "Nature Destinations". These are destinations with contrasting characteristics. Galápagos is the insular region of the country and was declared a Natural World Heritage Site in 1978. Most of its territory is in the protected area of the Galapagos National Park. Apart from the Galapagos Marine Reserve, it has unique species of flora and fauna in the world. Portoviejo, the capital of Manabí province, has a large population and is close to the different sun and beach attractions and the natural resource of Machalilla National Park. One of its artifacts is the toquilla straw hat, declared Intangible Cultural Heritage of Humanity. Tena is an Amazonian city with a tropical climate; it has the highest number of observations of species of animals, plants, fungi, and other bio-diverse microorganisms.

Table 6 depicts per cluster for each of the 16 considered accommodation indicators the mean value.

Table 6  
Comparison of the cluster means of Airbnb's 16 metrics

Cluster	Variables															
	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16
C1	45.50	12.50	15.00	11.00	0.00	2.00	15.00	11.50	5.00	10.00	0.00	3.95	45.50	10.00	6.00	13.00
C2	27.57	18.14	12.00	15.43	3.00	10.00	59.00	23.43	25.00	28.00	37.00	4.37	27.71	18.43	29.00	52.00
C3	11.50	11.00	50.00	70.00	1.00	3.00	38.00	22.00	11.00	24.00	107.00	4.67	116.00	29.00	34.00	10.00
C4	39.75	36.25	21.00	23.50	38.00	89.00	348.00	33.00	289.00	464.00	111.00	4.70	40.25	22.25	295.00	303.00
C5	38.00	40.00	27.00	15.00	276.00	681.00	4,028.00	43.00	1,546.00	2,379.00	113.00	4.56	39.00	18.00	2,440.00	3,289.00
C6	59.00	21.67	19.06	37.33	12.00	45.00	67.00	27.33	100.00	236.00	96.00	4.45	59.67	26.67	76.00	154.00

Metrics: Average daily rate (1), Occupancy rate percentage (2), RevPAR (3), Weekend RevPAR (4), Super-hosts (5), Multi-listing hosts (6), Single-listing hosts (7), Rental demand (8), Booked properties (9), Guest arrivals (10), Average weekly views (11), Average rating (12), Pricing entire home (V13), Pricing private room (14), Entire home (15), Private rooms (16).

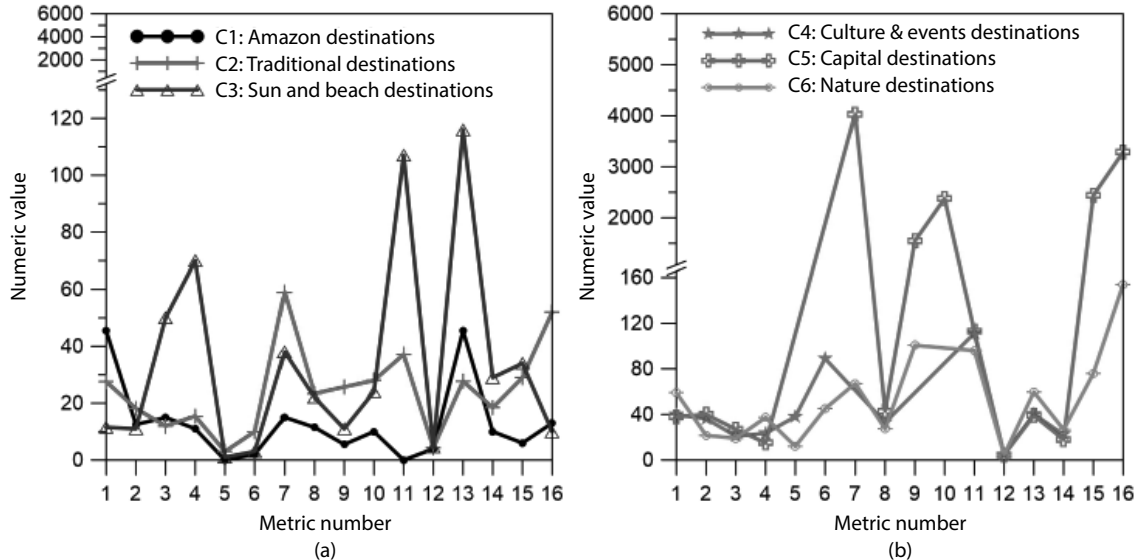
Figure 1a&b shows differences in Airbnb metrics between the 6 clusters. The highest ADR (V1) is that of cluster 6, "Nature Destinations," with a value of 59 dollars, and the lowest one is of cluster 3, "Sun and beach destination," with 11 dollars. The highest occupancy rate (V2) is found in cluster 6, "La Capital" with 40% and the lowest in the "Sun and beach destination" with 11%. are the highest of all clusters. Cluster 4 formed by the "Culture and events destinations" shows the highest average rating (V12) with 4.7. The Weekend RevPAR (V4) is the highest in the cluster 3, "Sun and beach destination" with 70 dollars.



Cluster 5, "Quito" is the destination that leads in the typology of super-hosts (V5) with 276, multi-listing (V6) with 681, and single hosts (V7) with 4028, rental requests (V9) with 1546, entire home (V15) with 2440, private rooms (V16) with 3289, guest arrivals (V10) with 2379, average weekly views (V11) with 113. At this destination, RevPAR (V3), the cost of the entire home (V13), and the cost of private rooms (V14) are the highest. It is noticed that more private rooms (V16) are rented than entire homes (V15) in all clusters, independent of the tourist level.

Figure 1a & b

Graphic presentation of the average metric value during the month November 2018



Note: Figure 1a&b. Graphic presentation of the average metric value during the month November 2018 for the considered 16 metrics of AirDNA, respectively for the clusters 1, 2 and 3 (Fig. 1a) and the clusters 4, 5, 6 (Fig. 1b).

## 5. Conclusions and implications

As suggested by Yoonjoung Heo et al. (2019), confirms the analysis of Airbnb's hosting activities in Ecuador, the company's business model offering a large variety of lodging. In the period of analysis did the research reveal that in the 22 examined destinations in Ecuador Airbnb's average occupancy rate is equal to 21.77%, the average daily rate (ADR) \$ 42.50, and RevPAR \$ 18.32. Airbnb's competition in Ecuador includes aspects such as price, with a variety of rates for entire houses and private rooms, in line with other researches (e.g. Gibbs et al., 2018; Guttentag & Smith, 2017; Wang & Nicolau, 2017; Xie & Kwok, 2017), mainly affecting two and three-star traditional hotels at destination. Airbnb's market share presents a diverse offer of accommodations, consisting of super-host, multi-listing host, and single-listing host lodgings, mostly belonging to one existing host (DiNatale et al., 2018; Lorde et al., 2019), with traditionally a higher rent for private rooms than for entire houses. On the other hand, Adamiak (2018) showed that the difference between the rent of rooms, houses, and apartments is primarily based on the destinations' level of tourist attractions. Another aspect of Airbnb in Ecuador is its contribution to the market with an excellent average rating of its guests and frequent visits to its website due to its divers offer, which is measured in its occupancy rate and rental demand, as shown in the studies by Aznar et al. (2016), Oskam et. al. (2018), and Zervas et al. (2015).

The characteristics of the examined 22 cities, based on 16 Airbnb's indicators, allowed the grouping of those cities in six clusters composed of cities having similar attraction patrons, respectively amazon destination (1), traditional destinations (2), sun and beach destinations (3), the attraction of the capital (4), tourists interest to nature destinations (5), and the visitors attracted by culture and local events (6). The clusters present the following common tourist characteristics: lodging typology, prices and rates, and market metrics. Quito, Ecuador's capital, is the tourist destination with the highest occupancy rate of Airbnb accommodations; the city encompasses the largest number of establishments of shared accommodations, attracts the largest number of visitors, and possess the highest score of reservations. The amount and type of accommodation offered by Airbnb varies according to the size of the city and the city's touristic attraction potential, a finding in line with the observation of Adamiak (2018), who mentioned that Airbnb's services in size and characteristics vary between cities and countries.

This study contributes to the limited literature on Airbnb's activities in Ecuador, consisting of a business model very much questioned by the country's formal hotel sector. In line with the findings of Yoon-joung Heo et al. (2019) more research is needed to accurately examine the effect of Airbnb's shared business model on the formal accommodation sector. In Ecuador, contributes the formal accommodation sector only 13% of all lodgings (Ministry of Tourism of Ecuador, 2018), with a lodging and hotel capacity of 5,177 establishments, corresponding to 97,717 rooms and 224,317 spaces (Ministry of Tourism of Ecuador, 2017). With the increasing quota of Airbnb on the tourist sector, questions the formal accommodation sector increasingly Airbnb's disruptive business model. In fact, more studies are needed to enable the formal sector identifying strategies that will enhance the competitiveness of the traditional accommodation sector.

At the other hand, it is noticed that Airbnb's shared business model has a transformative effect on tourist destinations, especially in those facing new consumption trends (Cruz & Pulido-Fernández, 2012). Airbnb's accommodations offer benefits in the tourist destinations they operate (Dogru et al., 2019), which of course also depends on the tourist segments of the destination tourists are targeting, Airbnb offers a variety of accommodation possibilities, i.e. the renting of entire houses, private rooms, shared sites (DiNatale et al., 2018), and this at a variety of prices, among other benefits that ensure tourist's satisfaction (Zervas et al., 2017). Similar as Airbnb is competing with the formal tourist and hotel sector, experiences Airbnb the growing competition of other players in the field, who are offering their services via the Online Travel Agencies, such as Booking, Expedia, among others, with similar characteristics as Airbnb's model (Christensen, 1997, p.11). The increasing competition between the different players on the tourist market will further stimulate the development and delivery of products based on disruptive technologies and approaches, which tend to be cheaper, smaller, more convenient in use, etc., facilitating the tourists' experience and stimulating the attraction to tourists' destinations. Furthermore, it is to be expected that Airbnb's market prices and metrics will inspire entrepreneurs in the housing sector to develop innovative tools that will positively affect their growth and income.

Although the 16 metrics of AirDNA permitted to develop an accurate analysis of Airbnb in Ecuador, it is to be expected that incorporation of the omitted metrics in AirDNA's database would have resulted in a more accurate and complete characterization of Airbnb's profile. An additional limitation of the study is that the 1-month data, November 2018 although known as a festivity month, is far too short to reconstruct a time-variable picture of Airbnb's activities. The limited length of this period was primarily due to the costs associated with the acquisition of AirDNA's data. Future research should not only focus on incorporating more destination indicators and observations over a much longer period but should also incorporate the profile and satisfaction of the Airbnb's customers, and whether Ecuador's cities included in this study are the ones showing the greatest concentration of available lodging and tourist attraction.

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## Notes

- <sup>1</sup> Under active accommodation is understood as at least one reservation during the research period.
- <sup>2</sup> *Provinces*: Ecuador is politically and administratively divided in 24 provinces; the provinces of Carchi and Pastaza are omitted due to lack of data.
- <sup>3</sup> *Capitals of the provinces*: The capitals of Los Ríos and Sucumbios are Babahoyo and Nueva Loja, which lacked information on AirDNA's database; for this reason, Quevedo and Lago Agrio were chosen instead. Galápagos is presented as a province in the database.
- <sup>4</sup> *Cultural Resources*: a) *Heritage Assets*: Total Personal Property, Real Property, Document, Archeological, and Immaterial per city. b) *Museums*: Number of museums for each province except the data for Quito and Guayaquil, which are presented per city.
- <sup>5</sup> *Natural Resources*: Marine Reserves, National Parks, Ecological Reserves, Biological Reserves, Wildlife Production Reserves, Wildlife Refuges, National Recreation Areas, Geobotanical Reserves, Municipal Conservation Area.
- <sup>6</sup> *Transport* (land, air, maritime and river) at each destiny that facilitates tourists transfer to the sites and other areas of interest. Scale (1=Few 5=Many)
- <sup>7</sup> AirDNA platform ([www.airdna.co](http://www.airdna.co)) between November 1 to November 30, 2018.

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## Appendix 1.

### Description of variables

Variable	Description
V1. Average daily rate	Quantitative. In dollars. ADR or Average Daily Rate is calculated by dividing the total revenue earned by the host for the entire reservation by the number of booked nights. Total Revenue (Daily Rates + Cleaning Fee) / Number of Booked Nights.
V2. Occupancy rate percentage	Quantitative. Percentage. Occupancy rate is calculated by dividing the number of booked nights by the number of available nights from active listings. Available: available for reservation Reserved: has been booked Blocked: has been blocked and is not available for reservation.
V3. RevPAR (revenue per available room)	Quantitative. In dollars. Income per available room. Average Daily Rate (ADR) by the occupancy rate.
V4. Weekend revenue per available room	Quantitative. In dollars. Income per available room on the weekend. Average Daily Rate (ADR)* The weekend occupancy rate.
V5. Superhosts	Quantitative. Number of hosts that serve as an example and an inspiration to other community members for the extraordinary experiences they offer their guests. Characteristics: Having successfully completed at least 10 reservations or 3 long stays totaling at least 100 nights in total. Having maintained an evaluation ratio of 50% or more. Having maintained a response rate of 90% or more. Not having canceled any reservation. Maintaining a general rating of 4.8.
V6. Multi-listing hosts	Quantitative. Number of Establishments. Active Listing of accommodations of a host who has more than one property under his/her account. Properties available on the Airbnb website during the last month.
V7. Single-listing hosts	Quantitative. Number of Establishments. Active Listing of accommodations of a host who only has one property under his account. Properties available on the Airbnb website during the last month.
V8. Rental demand	Quantitative. Punctuation. Relative demand for trips in this market. High score = High travel demand. The score is calculated by comparing the performance of this market with the main 2000 global Airbnb markets.
V9. Booked properties	Quantitative. Number of Properties that have been reserved at least once in the last month.
V10. Guest arrivals	Quantitative. Total number of guests in the last month of the available data. To calculate the number of guests who actually stay in each property, it is assumed that the properties are occupied with 70% of the room count.
V11. Average weekly views	Quantitative. Average number of times active establishments have been looked up last week.
V12. Average rating	Quantitative. Likert scale (1-5). Evaluation average of all properties' service.
V13. Pricing entire home	Quantitative. Dollars. <i>Daily rates + cleaning fees</i> for all days reserved in the last month for listings of complete homes.
V14. Pricing private room	Quantitative. Dollars. <i>Daily rates + cleaning fees</i> for all days booked in the last month for complete private room listings.
V15. Entire home	Quantitative. Number of entire homes rented in the last month.
V16. Private Rooms	Quantitative. Number of private rooms rented in the last month.

Source: Airbnb (2019), AirDNA (2019).