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Airbnb general behavior in the three most populous cities of Ecuador: Availability, guests' place of origin, and occupancy rate

Comportamiento general de Airbnb en las tres ciudades más pobladas de Ecuador: disponibilidad, lugar de origen de los huéspedes y tasa de ocupación

SERRANO, Ana L.[1]
ASTUDILLO, Silvana V. [2]
GUTIERREZ, Zaida P.[3]

Resumen
El objetivo de este estudio es comprender el impacto del servicio de Airbnb con respecto a la tasa de ocupación hotelera, el lugar de origen de los huéspedes, las redes sociales y el crecimiento de las propiedades de Airbnb en las tres ciudades más pobladas de Ecuador: Guayaquil, Quito, y Cuenca durante seis meses (diciembre de 2018 a mayo de 2019). Se analizó una base de datos comprada por los autores de este estudio en el portal web airdna.co para identificar la cantidad de lugares disponibles, la cantidad de reservas y la tasa de ocupación. Los resultados muestran que hay un aumento significativo de 818 propiedades de Airbnb durante los seis meses evaluados. Los huéspedes internacionales son los usuarios más frecuentes del servicio, especialmente los que provienen de la ciudad estadounidense de Nueva York. Con respecto al uso local, los huéspedes más recurrentes son residentes de las tres ciudades analizadas. El medio por el cual reciben información sobre las propiedades de Airbnb es a través de Facebook y el navegador web de Google. Existen diferencias significativas entre la tasa de ocupación de Airbnb y la tasa de ocupación de hoteles en Quito, Guayaquil y Cuenca, que muestra una tasa de ocupación más alta en hoteles que en los servicios de Airbnb durante los seis meses analizados.
Palabras clave: Airbnb, tasa de ocupación hotelera, economía compartida.

Abstract
The objective of this study is to understand the impact of the Airbnb service with respect to hotel occupancy rate, place of origin of the guests, social media, and the growth of Airbnb properties in the three most populous cities of Ecuador: Guayaquil, Quito, and Cuenca during six months (December 2018 to May 2019). A database that was purchased by this study's authors on the web portal airdna.co was analyzed to identify the number of available places, the number of reservations, and the occupancy rate. The results show that there is a significant increase of 818 Airbnb properties during the six months evaluated. International guests are the most frequent users of the service, especially guests coming from the US city of New York. With respect to local use, the most recurrent guests are residents from the three cities analyzed. The means by which they receive information about the Airbnb properties is through Facebook and the Google web browser. There are significant differences between the Airbnb occupancy rate and the hotel occupancy rate in Quito, Guayaquil, and Cuenca, which shows a higher occupancy rate in hotels than in Airbnb services during the six months analyzed.
Key words: Airbnb, hotel occupancy rate, shared economy.

[1] P.h.D. in Job satisfaction with an emphasis on human capital, Teacher and Researcher of the bussines and tourism research group of the Faculty of Hospitality Sciences, Universidad de Cuenca-Cuenca, Ecuador. ana.serrano@ucuenca.edu.ec
[2] P.h.D in Bussines Administration,Teacher and Researcher of the bussines and tourism research group of the Faculty of Hospitality Sciences, University of Cuenca – Cuenca, Ecuador. silvana.astudillo@ucuenca.edu.ec
[3] Master in Bussines Administration,Planning Director at the University of Cuenca Public Company,Professor at the Faculty of Economic and Administrative Science, University of Cuenca, Cuenca, Ecuador. zaida.gutierrez@ucuenca.edu.ec

1. Introduction

Airbnb is the most preferred travel website among the market leaders of the world (Bhardwaj, Gautam, & Pahwa, 2017). Airbnb was founded in 2008 in San Francisco, California, where it has a high penetration rate (Gunter, 2018). In Europe, Paris has the highest number of Airbnb listings (Adamiak, 2018). In Australia, from 2015 to 2017, the evolution of Airbnb usage has increased from 2.5 to 9.5% (Volgger, Taplin & Pforr, 2019). This service offers the opportunity to travel to more places, to increase travel frequency, to extend the length of stay, and to broaden the range of activities experienced in touristic destinations that otherwise would be cost-prohibitive (Tussyadiah & Pesonen, 2016).

The main reason why people prefer an Airbnb service rather than a hotel is the relatively low cost it offers. The low costs are due mostly to the fact that hosts pay for domestic services like electricity, water, etc. A study reflected the price difference among hotels, hostels, and Airbnb in six destinations such as Chicago, Montreal, Rio de Janeiro, Sydney, and Venice during a Friday night accommodation for one adult. A hostel has the cheapest cost (around $31), next an Airbnb shared room (around $63), after that the cost of an Airbnb private room (around $115), a hotel of 1-2 stars (around $150), and a 3 star hotel (around $150), and finally, an entire Airbnb home or apartment (around $232) is similar to a 4-5 stars hotel (around $239) (Guttentag, 2015). The Revenue Per Available Room (*RevPAR)* has been affected by the Airbnb listings, especially in lower scale hotels; according to a regression model, every increase in the review score of an Airbnb property has a negative impact of $25.54 on RevPAR for hotels. But the disruption of the hotel industry occurs slowly, and its effect goes beyond the 'supplement' role claimed by Airbnb founders and looks more like a substitution role instead (Blal, Singal, & Templin, 2018).

Traditionally, low and medium-end hotels set lower prices for holidays or weekends, but this practice does not occur with high-end hotels (Roma, Panniello & Lo Nigro, 2019). Airbnb constitutes a problem for the traditional hospitality industry because it proposes a different business model where the landlord of this service does not work as a professional of the hotel industry. For example, the landlord does not speculate with the price to charge higher prices for weekends or holidays (Aznar, Sayeras, Segarra & Claveria, 2018).

In Barcelona, a study revealed that the driving mechanism of Airbnb versus hotel location patterns depends on the residential area with well-defined touristic characteristics. The offer decreases based on the distance from the center and from the beach, commercial or industrial activities (Gutiérrez, García-Palomares, Romanillos & Salas-Olmedo, 2017). A study in Vienna revealed that some variables like listing size, number of photos, and responsiveness of the host makes the difference between a hotel and an Airbnb property (Gunter & Önder, 2018). According to another study, there are significant differences between the customers who book Airbnb and those who do not. Differences were detected by a survey scale which showed that the main factors associated with preferring Airbnb services are company recommendations, location, amenities, past experiences and loyalty; and for those who do not use Airbnb services, the factors are website, advertising, travel agent, security, service quality, appearance, kitchen and housekeeping/cleaning, and participation in loyalty programs (Varma, Jukic, Pestek, Shultz, & Nestorov, 2016). However, another study that worked with a database of 12 countries and 33 cities from Europe and North America revealed that almost every variable that hotel services offer are equally offset by the price of Airbnb services (D. Wang & Nicolau, 2017). In Sidney, Australia, location (100%), amenities (81%), and hosts (70%) are the key attributes according to a study that used text mining to analyze data from the Inside Airbnb website (Cheng & Jin, 2019).

This paper presents a theoretical framework which considers a background according to the number of Airbnb locations, the nationality of the guests, the social network used by the client to find the Airbnb service, and

finally, the impact of Airbnb services on the hotel industry. After that, the methodology used to manage the database is explained. Finally, the paper presents the results, discussion, conclusions and clarifies the limitations.

1.1 Biliographic analysis

1.1.1. Market penetration of Airbnb

Airbnb services are present in 65,000 cities in 191 countries and boasts over 3 million users (Blal et al., 2018); another source states that this service reaches 3 million guests in more than 34,000 cities in 191 countries around the world (Levendis & Dicle, 2016). In San Francisco, Airbnb accounts for around 40% of all the potential rental market in the city (Carson, 2015). Airbnb penetrates the accommodations industry most significantly in the area of supply, whose level was evaluated in 10 cities around the world, showing that the market has a presence in a range from 1.8 to 8.9% in the top hotel markets. This service is highest in markets where hotels have high occupancy but not more occupancy (Haywood, Mayock, Freitag, Owoo & Fiorilla, 2017). The compound annual growth rate (CAGR) of Airbnb during 2017 was around 142%, meaning there were 200 million rooms booked per night for that year (Dogru, Mody & Suess, 2019). Most customers (at least 61.9%) are interested in an entire home/apartment to rent when using Airbnb (Cheng & Jin, 2019).

In New Orleans, from 2011 to 2015 the number of tourists increased from 8.75 to 9.78 million. In this city, from September 2015 to September 2016, a total of 286,619 guests used Airbnb for a total of 338,585 booked nights ranging from one night to fewer than 30 nights. Airbnb guests spent a total of $169,017,209, while Airbnb visitors spent an average of $778 dollars per visit, which accounted for an increase of 4,480 jobs in a year (Levendis & Dicle, 2016).

In Ecuador, Airbnb services have increased significantly. For instance, in Quito it expanded from 86 in 2011 to 6,288 booked rooms in 2017, in Guayaquil from 7 in 2011 to 1,258 booked rooms in 2017, and in Cuenca from 7 in 2011 to 1,047 booked rooms in 2017. In Ecuador, hosts share their houses to obtain extra income (68%), and they only pay 3% to Airbnb for handling booking. There are 4,800 hosts who receive an average of $980 dollars per month. During a month there are 45,200 total Airbnb guests in Ecuador (Airbnb, 2017), with an average stay time of 4.4. days.

The research question the present study seeks to resolve is:

How many Airbnb locations exist in Guayaquil, Quito, and Cuenca?

1.1.2. Place of origin of the guests

The World Tourism Organization (UNWTO), states that there are two types of tourists in the 197 countries that are part of this organization: those who reside within the nation in which they are traveling, and those who travel to another nation different from the one in which they reside. The UNWTO used registers from the police, immigration, and other control types, even surveys, in the host establishments to analyze the year 2016. Almost a third of the visitors from the Americas in Ecuador during the year 2016 were from North America (specifically 267,000 from the USA); two thirds were from South America (specifically from Colombia 319,000, and from Peru 148,000); from Europe there were 243,000 (specifically from Germany 31,000); from East Asia and the Pacific there were 76,000 (specifically from China 22,000and Philippines 22,000); finally, from Africa there were around 4,000 visitors (UNWTO, 2018).

There are a few studies about Airbnb guests' country of residence. One of them was developed in Australia. This study showed that the largest number of guests visited from Singapore, Malaysia (10%); the second largest number visited from Europe (9.2%); the third were guests from the USA and Canada (8.9%); the fourth were tourists from the United Kingdom (6.7%); and, finally, there were guests from China (5.1%), among others (Volgger et al., 2019)

Guests use three types of social contact when they decide to travel: with the hosts, with the community, and with other guests. Every contact is important to guests because it is the primary way in which they evaluate their travel experiences (Lin, Fan, Zhang, & Lau, 2019). A study about trip-making for social purposes, with a special focus on the demographic factor of ageing, showed that people under 70 years old, with higher education and who work more than 35 hours per week, are the people most likely to travel. Additionally, these people are more inclined to immerse themselves in the local culture (van den Berg, Arentze, & Timmermans, 2011).

One study considered the clients' Airbnb behavior: first, a potential guest typically views only a part of potential matches in the marketplace, and more than 40% of the listings remain vacant for some dates; after that, hosts accept transaction proposals by potential guests 51% of the time (Fradkin, 2015). However, one research study suggests that there is racial discrimination on Airbnb. This research found that some people have high and others have low reputations according to the host's and the guest's racial origin (Ye, Alahmad, Pierce, & Robert, 2017). Another study shows racial discrimination when non-black hosts charge around 12% more than black hosts in the Airbnb rental. The researchers consider that this information is based on the personal profiles sent to the platforms, information that provides the seller's race, gender, age, or other aspects of appearance (Edelman & Luca, 2014).

It is important to note that in Ecuador there is no information about the following question:

Who uses Airbnb properties in Guayaquil, Quito, and Cuenca, and how do they use them?

1.1.3. Impact of Airbnb on the hotel industry

There are some studies that show the impact of Airbnb on small hotels. An example is the causal impact in Austin, Texas, which specifically showed that a 1% increase in Airbnb listings produced a 0.05% decrease in quarterly hotel revenues; the main impact occurred with lower-end hotels, which affected revenue 8%-10% (Zervas, Proserpio, & Byers, 2017). A study that involved an online survey of tourists who had used Airbnb showed that two out of three Airbnb guests use this service as a substitute for a hotel (Guttentag & Smith, 2017). One study showed that the increase in Airbnb use in the Coachella Valley, California, has impacted negatively on the general hotel industry revenue, but the impact cannot be shown specifically for each category of hotels (S. Wang, 2017). Another study showed that Airbnb negatively affected hotels in three metrics like RevPAR, ADR, and occupancy rates in ten key U.S. markets over the course of a decade. The impact is not only in lower-end hotels but also across hotel class segments, signaling a high level of consistency with the tenets of the theory of disruptive innovation; specifically, a 1% increase in Airbnb decreases hotel RevPAR by 0.04%, 0.02%, 0.03%, 0.03%, 0.04%, and 0.02% (Dogru et al., 2019).

The increase of Airbnb services is not a common situation around the world. In Korea, for example, Airbnb has not produced an impact on hotel revenue. Most tourists use hotels rather than Airbnb because its website has a low level of awareness there (Hong Choi, Hyun Jung, Yeol Ryu, Do Kim & Min Yoon, 2015). A study in Boston, USA, suggested that Airbnb does not impact hotel occupancy. According to this study, during 12 years, hotels in the city have had an average occupancy between 74 and 85%, but during the last year the average occupancy increased to 90%, which occurred even though Airbnb services have increased; thus, this service does not seem to adversely affect the hotel industry (Mody, Suess, & Dogru, 2017). Another study specifically showed that the ADR metric of hotels in 12 out of 13 cities of USA increased during 2016, while Airbnb rates decreased in eight of those markets for that year (Haywood et al., 2017).

One notable metric that points to a preference of Airbnb over hotels is that most Airbnb users around the world, approximately 95%, have rated their Airbnb stay between 4.5 to 5 stars (the maximum); almost none have rated it less than 3.5 stars. This does not occur with hotels, which receive an average of 3.8 stars (Zervas, Proserpio, &

Byers, 2015). Price is correlated with space attributes, such as the entire home or private room, and has less correlation with quality attributes, such as friendliness, freebies, and location (Dogru & Pekin, 2017).

Another study based its analysis on the fact that Airbnb had a positive effect on consumers who are part of the hotel industry. This argument maintains that hotel revenues would be 1.5 percent higher without the presence of Airbnb. Nevertheless, between 42 and 63% of the respondents in this study would not have made hotel bookings if this alternative service were not available. The study also indicated that Airbnb has accommodations that are different in price, especially during high peak times (Roach, 2018).

It is important to compare the occupancy rate of hotels and Airbnb properties to answer the following question:

What is the impact of Airbnb on the hotel industry?

2. Methods

Two sources of data were used for the purposes of this study. The first source of data was obtained from an AirDNA database (www.airdna.co). The second source of data came from a database from the University of Cuenca, Ecuador, and considers the situation of the city of Cuenca. The data from the University of Cuenca presented information of the occupancy rate from the city; in order to maintain confidentiality, property data was coded using an identification number for each hotel.

2.1. Airbnb sample and data

The authors of this study purchased a database from AirDNA (www.airdna.co). This Airbnb database (2019) provided the number of existing establishments in Ecuador's three most populous cities (Guayaquil, Quito, and Cuenca), specifying the number of places, booked properties, the income per room, shared room, and entire home per month, national and international guests per month, market activity, and, finally, the social network used the most to find a place in these cities. To determine the total number of available Airbnb places, the market activity data of 270 dates was used from December 18, 2018, to March 19, 2019 (Figure 1); to determine who uses Airbnb properties, the nationality data of 159 dates was used from August, 2016, to November, 2018 (Table 1); to determine how guests use Airbnb properties, the top national and international cities data of 57 dates was used from an indeterminate date (Table 2). Finally, the database provided a summary in percentages of the social network that guests used to find Airbnb information (Table 3).

2.1.1. Airbnb occupancy rate

It was not possible, however, to calculate directly the Airbnb occupancy rate because, on the one hand, the first set of data provided the number of monthly booked nights from December 2015 to November 2018; on the other hand, the other set of data provided the daily available properties from December 18, 2018 to March 18, 2019 for each of the three cities. In order to provide updated information, an Autoregressive integrated moving average (ARIMA) model was used to predict (forecasting) the monthly booked nights from December 2018 to May 2019 based on the data from December 2015 to November 2018. The same model was used to predict the daily available properties from April 2019 to May 2019 based on the data from December 18, 2018 to March 18, 2019 for each of the three cities.

The ARIMA model was conducted in SPSS 22 using a natural logarithm transformation for both the model and the transfer function (independent variable). Also, software detected atypical values automatically by adding and changing the level. In all the six models (three for daily available properties and three for monthly booked nights), the stationary R squared is greater than 0.90 and the Ljung-Box Q statistic (18) is significant (sig. <0.05) (IBM Corporation, 2013). The model makes it possible to find the average of daily booked nights per month and

the average of daily available properties per month in order to calculate the Airbnb occupancy rate from December 2018 to May 2019. (Table 4).

2.2. Hotel occupancy rate

The hotel occupancy rate (number of booked nights over the sum of available nights and booked nights) was taken from the website of the Coordinación General de Estadística e investigación - MINTUR (Ministerio de Turismo del Ecuador, 2019). This research considered the last month of 2018 and the and the months january, february, and march of 2019 (Table 4).

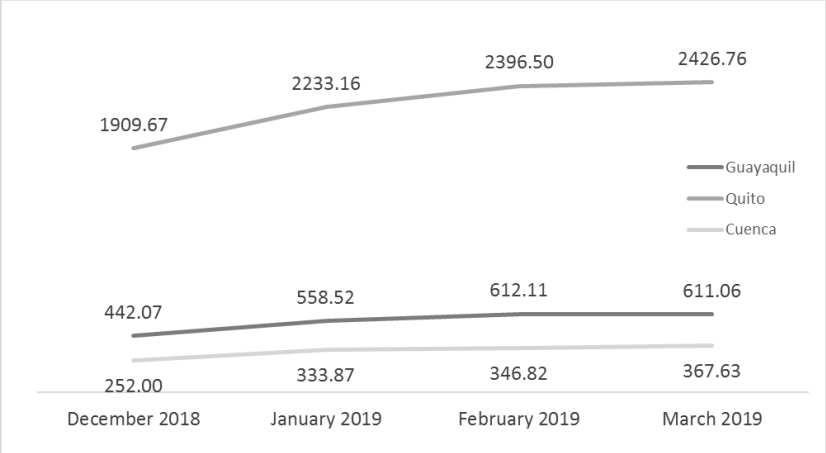
2.3. Data analysis

The databases were analyzed using IMB statistical software SPSS 22, which describes and analyzes the results (Field, 2013). To determine how many Airbnb locations exist in the three cities studied, a descriptive analysis of the average number of available properties was used. The information is expressed directly with the number of locations in Guayaquil, Quito, and Cuenca (Fig. 1). To better understand where guests who use Airbnb properties in the three cities reside, a comparison was made between national and international tourists, and national and international cities according to each year analyzed using bivariate analysis. To compare national and international guests or to compare national and international cities, a *t* Test for independent samples was conducted. To compare national and international guests and national and international cities within the three years studied, a one-way ANOVA was conducted. The information is expressed in mean, standard deviation (St. Dev.), F (one-way ANOVA) η^2 (eta squared). Finally, to compare the hotel occupancy rate with the Airbnb occupancy rate, X^2 (Chi squared) and *w* (Cohen's w effect size) was used. The results are expressed in percentages.

3. Results

According to the first question, how many Airbnb locations exist in Guayaquil, Quito, and Cuenca, these cities were evaluated during four months regarding their monthly average of available lodges: December 2018, January 2019, February 2019, and March 2019 (Fig. 1). Each city significantly increased the number of available lodges during these four months. In Quito, the average increased from 1909.67 (Standard Deviation 42.70) to 2426.76 (Standard Deviation 88.47); this is a significant difference between the four months [F (3 and 86 df) = 207***; effect size 2.68]. In Guayaquil, the number increased from 442.07 (Standard Deviation 20.66) to 611.06 (Standard Deviation 28.60), also considered a significant difference between the four months [F (3 and 86 df) = 285***; effect size 3.21]. And, in Cuenca it increased from 252.00 (Standard Deviation 33.66) to 367.63 (Standard Deviation 26.95), also showing a significant difference between the four months [F (3 and 86 df) = 97.67***; effect size 1.72]. Turkey's Post Hoc Test confirmed that there is a difference between December to January, but February to March are similar in Quito and in Guayaquil; however, in Cuenca, January and February are similar.

Figure 1
Mean monthly lodge availability for informal Airbnb



Source: Own elaboration

Regarding the second question, who used Airbnb properties in Guayaquil, Quito, and Cuenca from 2016 to 2018?, the answer is divided into three parts (Tables 1, 2, and 3). There are two kinds of guests that use the Airbnb service for lodging: national and international. There was an average of 133 national guests in Guayaquil during the 27 months evaluated, an average of 199.66 in Quito during the 34 months evaluated, and an average of 90.96 in Cuenca during the 27 months evaluated. There was an average of 295.81 international guests in Guayaquil during the 27 months evaluated, an average of 1258.83 in Quito; and an average of 290.48 in Cuenca. This frequency was evaluated during three years: 2016, 2017, and 2018. National guests accounted for a significant increase in Quito and in Guayaquil during the three years but not in Cuenca; international guests also accounted for a significant increase in the three cities (Table 1). Also, there is a significant difference between national and international guests in Guayaquil [t (26 gl) =10.24***; effect size=1.98], Quito [t(33 gl)=17.82***; effect size=3.05], and Cuenca [t(26 gl)=11.17***; effect size=2.03]. The Airbnb service is used much more by foreigners than by Ecuadorians.

Table 1
National and international guests average and standard deviation during the years 2016-2018

		2016		2017		2018		Total		F	η^2
		Mean	(St. Dev.)	Mean	(St. Dev.)	Mean	(St. Dev.)	Mean	(St. Dev.)		
National guests	Guayaquil	74.60	(14)	115.67	(66)	184.80	(51)	133.67	(68)	7.93**	0.63
	Quito	146.58	(62)	175.25	(67)	301.40	(73)	199.66	(93)	16.06***	0.89
	Cuenca	85.80	(70)	69.25	(21)	119.60	(59)	90.96	(52)	3.02	0.32
International guests	Guayaquil	154.00	(30)	258.50	(57)	411.50	(103)	295.81	(122)	22.42***	0.94
	Quito	982.50	(368)	1198.58	(210)	1722.00	(250)	1258.83	(420)	18.87***	0.81
	Cuenca	232.80	(17)	251.25	(46)	366.40	(108)	290.48	(93)	8.56**	0.54

Source: Own elaboration F means ANOVA and η^2 means eta squared.

Regarding the top national guests, it is important to note that in Guayaquil, Airbnb lodgings are rented by people from Quito (60.8%) and from the city of Guayaquil (17.90%). In Quito, Airbnb lodgings are rented by people from

Guayaquil (34.47%) and from the city of Quito (45.38%). In Cuenca, most Airbnb rentals are made by people from Guayaquil (44.70%) and then by people from Quito (38.67%). International guests come primarily from New York City. In Guayaquil, they constitute 43.6%, in Quito 27.1%, and in Cuenca 28.5%. The second city of origin varies slightly. In Guayaquil and in Quito international guests come from Miami with 12.8% and 10.7% respectively. In Cuenca, international guests come from London with 10.6%.

Table 2

Top national and international guests that used Airbnb in Quito, Guayaquil, and Cuenca 2016-2018

		Guayaquil	Quito	Cuenca	Total
		n (%)	n (%)	n (%)	n (%)
National city	Quito	1613 (60.80)	1916 (45.86)	814 (38.67)	4343 (48.60)
	Guayaquil	475 (17.90)	1440 (34.47)	941 (44.70)	2856 (31.96)
	Cuenca	52 (1.96)	327 (7.83)	114 (5.42)	493 (5.52)
	Machala	256 (9.65)	96 (2.30)	88 (4.18)	440 (4.92)
	Manta	95 (3.58)	65 (1.56)	44 (2.09)	204 (2.28)
	Ambato	40 (1.51)	132 (3.16)	19 (0.90)	191 (2.14)
	Riobamba	45 (1.70)	61 (1.46)	13 (0.62)	119 (1.33)
	Portoviejo	25 (0.94)	59 (1.41)	16 (0.76)	100 (1.12)
	Ibarra	0	44 (1.05)	0	44 (0.49)
	Loja	0	0	40 (1.90)	40 (0.45)
	Baños	0	38 (0.91)	0	38 (0.43)
	Salinas	28 (1.06)	0 (3.16)	0 (0.90)	28 (0.31)
	Esmeraldas	24 (0.90)	0	0	24 (0.27)
	Azogues	0	0	16 (0.76)	16 (0.18)
International city	New York	597 (43.6)	1342 (27.1)	264 (28.5)	2203 (30.4)
	Miami	175 (12.8)	469 (9.5)	77 (8.3)	721 (10.0)
	London	86 (6.3)	529 (10.7)	98 (10.6)	713 (9.8)
	Chicago	67 (4.9)	413 (8.4)	92 (9.9)	572 (7.9)
	Bogotá	84 (6.1)	441 (8.9)	0	525 (7.2)
	Los Angeles	85 (6.2)	418 (8.5)	0	503 (6.9)
	Toronto	71 (5.2)	399 (8.1)	0	470 (6.5)
	San Francisco	0	325 (6.6)	0	325 (4.5)
	Washington	0	327 (6.6)	0	327 (4.5)
	Atlanta	0	283 (5.7)	0	283 (3.9)
	Austin	66 (4.8)	0	55 (5.9)	121 (1.7)
	Portland	0	0	96 (10.4)	96 (1.3)
	Fort Lauderdale	73 (5.3)	0	0	73 (1.0)
	Charlotte	66 (4.8)	0	0	66 (0.9)
	Ottawa	0	0	64 (6.9)	64 (0.9)
	Seattle	0	0	65 (7.0)	65 (0.9)
	Calgary	0	0	58 (6.3)	58 (0.8)
	Montreal	0	0	57 (6.2)	57 (0.8)

Source: Own elaboration. The percentages do not represent the total visits of all the cities but only the ranking of the cities listed.

The Airbnb matrix reported the percentage values of the social media profiles listed by guests on their profiles. The social network with the highest amount of information was Facebook: in Guayaquil 72%, in Quito 76%, and in Cuenca 70.7%; the second was Google: in Guayaquil 21%, in Quito 20%, and in Cuenca 23.2%.

Table 3

Top social media profiles listed by guests on their profiles on the platform in Airbnb in Quito, Guayaquil, and Cuenca 2016-2018

	Guayaquil	Quito	Cuenca	Total
	n (%)	n (%)	n (%)	n (%)
Facebook	72 (72.0)	76 (76.0)	71 (71.0)	219 (73.0)
Google	21 (21.0)	20 (20.0)	23 (23.0)	64 (21.3)
Linkedin	7 (7.0)	4 (4.0)	6 (6.0)	17 (5.7)
Total	100 (100)	100 (100)	100 (100)	300 (100.0)

Source: Own elaboration

Regarding the third question, what is the impact of Airbnb in the hotel industry?, formal and informal places were compared. The occupancy rate did not increase during the six months studied, both in hotels and in Airbnb in the three cities. However, the occupancy rate is different between hotels and Airbnb in almost all the months. The occupancy rate in hotels is higher than the occupancy rate of Airbnb in the three cities. In Guayaquil, the hotel average is 50,81% and the Airbnb average is 31,85%. In Quito, the hotel average is 42,88% and the Airbnb average is 21,04%. Finally, in Cuenca, the hotel average is 35,62% and the Airbnb average is 13,80%. Only in Guayaquil during April there is a similar occupancy rate between hotels (46%) and Airbnb (33%) (X2=3,54, p=0,060). For all the other cases, hotels and Airbnb places are similar. These comparisons were conducted using X^2. In the six months analyzed it is not possible to show a decrease of the hotel industry related to the increase of Airbnb service and vice versa; therefore, there is no impact of Airbnb on the hotel industry.

Table 4
Average hotel occupancy rate and average Airbnb occupancy rate in Cuenca during six months

		Hotel	Airbnb	X^2	*w*
Guayaquil	December	48	25	11,41**	0,46
	January	50	34	5,26*	0,32
	February	59	34	12,56***	0,51
	March	48	31	6,05*	0,43
	April	46	33	3,54	-
	May	52	31	9,08**	0,42
Quito	December	37	26	2,8	
	January	39	22	6,82**	0,35
	February	45	22	11,87**	0,46
	March	47	19	17,73***	0,56
	April	48	18	20,35***	0,60
	May	40	17	12,98***	0,47
Cuenca	December	30	16	5,53*	0,31
	January	32	14	9,15**	0,39
	February	40	14	17,15***	0,53
	March	36	13	14,29***	0,48
	April	37	13	15,36***	0,50
	May	37	13	15,36***	0,50

Source: X^2 means Chi squared and *w* means Cohen's *w* effect size. The hotel occupancy rate has been taken directly from the website of the Coordinación General de Estadística e investigación - MINTUR (Ministerio de Turismo del Ecuador, 2019). Moreover, the Airbnb occupancy rate has been created using an Autoregressive integrated moving average (ARIMA) model from the number of booked nights (December 2015 - November 2018) and the number of available places (December 18, 2018 - March 18, 2019) from the AirDNA database (www.airdna.co).

3.1. Discussion

Results show that there are more than three thousand available informal Airbnb properties in Ecuador, especially in the city of Quito. It is an increasing rental signal if we consider that during the year 2011, there were no more than 100 places in these cities. In other countries, the number of available Airbnb rentals increased by more than a million in a similar range (Dogru et al., 2019; Haywood et al., 2017; Levendis & Dicle, 2016). Therefore, in Ecuador, the rate of increase is similar to what happened in other places throughout the world.

Around the world, people who travel most are typically from developed countries, especially North America, Europe, and some Asian countries. However, people also travel to neighboring countries looking for economic opportunities. According to the UNWTO (2018), in Ecuador most visitors come from the region of South America, especially from the neighboring countries of Colombia and Peru. The second highest number of visitors to

Ecuador arrive from North America, especially the USA. It is important to note that only the visitors that come from North America and Europe are included in the ranking of guests of the Airbnb platform. Consequently, the visitors from the region were not measured. The principal way in which guests receive information about available Ecuadorian Airbnb rental properties is through the social network Facebook or Google browser.

Related to the impact of Airbnb on the hotel industry in Ecuador, the latest public information of Airbnb from 2019 indicates that the occupancy rate average in Guayaquil is 51%, in Quito 38%, and in Cuenca 36% (Airbnb, 2019). Considering this increase, it is possible that the Ecuadorian hotel industry is suffering from this competition like in other countries (Dogru et al., 2019; Guttentag & Smith, 2017; Proserpio, 2016; Wang, 2017; Zervas et al., 2017). However, this study does not have enough evidence to conclude that Airbnb services have created a significant difference in the occupancy rate during the six months studied (December 2018-May 2019) with respect to hotel services. In light of these results, the present study found agreement with other studies that propose that at the beginning of the growth of Airbnb, the service did not have an impact on the hotel industry (Haywood et al., 2017; Hong Choi et al., 2015; Mody et al., 2017). This is not the first time that a study has shown that Airbnb services contribute to expanding the tourism industry (Fang, Ye & Law, 2016). Yet, this is the first time that a study has shown evidence that the effect of the beginning of Airbnb services in Ecuador does not have a severe impact on its hotel industry.

In addition to these results, it is also important to note that Airbnb opened a low-cost possibility to travel. In Singapore, short-term leasing for less than six months is also illegal for private home owners, but it is possible to consider Airbnb not as a competitor but rather as a collaborator to take advantage of the growing opportunities in expanding the country's tourism economy (Koh & King, 2017).

3.2. Limitations

The information available is not enough to show the impact of Airbnb on hotel revenues or hotel occupancy in the cities studied because the sample was not randomized. The Airbnb occupancy rate only encompassed six months and only specific information about places from December 18, 2018 - March 18, 2019, and booked nights from December 2015 - November 2018, according to the available information provided by the AirDNA database (www.airdna.co). However, the information from the results could act as a guide for improvements in the management of tourism and hospitality (Cheng & Foley, 2019).

4. Conclusion

In the three most populous cities of Ecuador, Guayaquil, Quito, and Cuenca, there was an increase of 818 Airbnb properties from December 2018 to May 2019. International guests use Airbnb services much more than national guests; they find information principally on the Internet's social network site of Facebook and using the Google browser. Finally, there is a significant difference between the occupancy rate of hotel and Airbnb allocation services in the three main cities; in the three cases hotel occupancy rates are higher than Airbnb occupancy rates during the six months analyzed. However, further studies are needed to have a better understanding of the effects of Airbnb services in Latin America.

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