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What is happening in Paris? Airbnb, hotels, and the Parisian market: A case study

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9   **ABSTRACT**

10   Airbnb has been the subject of heated discussions among tourism and hospitality scholars. In
11   order to understand the true impact of P2Psharing on the tourism and hospitality landscape, it
12   is important to understand that market in detail first. Therefore, in this paper, we explore the
13   development of the Airbnb market over the last seven years in Paris, the most popular
14   destination for Airbnb guests with more than 40,000 accommodation rentals. This research
15   note is a summary of our findings on the Paris market. Our study shows different growth and
16   seasonality patterns for Airbnb and hotels and dissimilarities in the geographical location of
17   the offers. The findings indicate that the two products are not in direct competition and that
18   their relationship might be more complex than previously thought. We trust that exploring the
19   nature of the competitive relationship would be a valuable avenue for further investigation.
20
21   **Keywords**

22   Sharing economy; P2P sharing; Collaborative consumption; Airbnb; P2P accommodation
23   rental; Paris

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1. Introduction

Airbnb has been the subject of numerous and often heated discussions among hoteliers and academics in the industry. The original "Airbed and Breakfast" offer of two students in San Francisco, abbreviated AirBnb since, is a platform that allows people to look for, rent and/or list properties for accommodation. While official revenues have not been disclosed, Fortune magazine reports that Airbnb's annual revenues are expected to reach $10 billion by 2020. Despite this meteoric growth, major hotel chains have yet to show substantial action to withstand the potential competition from the sharing economy. Steve Joyce, the chief executive of Choice Hotels International, mentioned that his brands had not seen any effect from Airbnb. Equally, Kerry Ranson, chairman of the InterContinental Hotels Group Owners Association, said that he did not see Airbnb as a threat or a competitor (Weed, 2015). Hilton CEO Chris Nassetta expressed a similar view, saying that Airbnb was not a major threat to his company's business and the effect of Airbnb is heterogeneous across hotel markets (Bryan, 2015).

However, HVS analysts reported that the overall impact of Airbnb's operations in New York City is estimated to be $2.1 billion over the twelve-month period from September 2014 through August 2015. Further, the report concluded that Airbnb has eliminated more than 2,800 jobs and resulted in more than $226 million annually in lost tax revenues for local, state, and federal governments. And recent research appears to substantiate these findings. Zervas, Proservio, and Byers (2017) measured that a 1% increase in Airbnb listings causes a .05% decrease in hotel revenues in the U.S. state of Texas. But according to STR research, Airbnb did not have a measurable effect on hotel demand in Manhattan. Similarly, analysts at Deutsche Bank noted that in many major cities, hotel revenue per available room was maintained while the supply of rooms including Airbnb listings has increased significantly

(Bryan, 2015). Their view is that Airbnb is not a risk for hotels. To the contrary, they see such businesses growing the market by creating new demand. These analysts draw the parallel between the sharing economy in the hotel industry and the low-cost airlines in the air transportation sector. Low-cost airlines such as EasyJet or Ryanair expanded the travel market and provided opportunities for those who would otherwise not have been able to travel, or would have travelled less frequently otherwise.

In line with this viewpoint, Airbnb claims that its offer has had positive economic impact. In France, for instance its executives report that its visitors contribute significantly to France's tourism industry, local businesses and local households (Airbnb, 2015). According to an Airbnb report, the company has contributed to the increase in tourism in France. Indeed, they report that 23% of Airbnb guests said they would not have gone on their trip or would not have stayed as long without Airbnb. Also, 66% of Airbnb guests said they would not have stayed in a hotel even if Airbnb had not been an option. We therefore have contradictory opinions and stands on the effects of Airbnb on the hotel business.

As the rise of P2P sharing services changed the way people travel, it is not only changing competitive landscape in the hotel industry, but also transforming the tourism industry. This new trend has blurred the boundaries between consumers and service providers as well as local residents and business entities in the tourism destination (Heo, 2016). Further, Airbnb claims that it gave some tourism destinations the chance to diversify beyond typical tourist hot spots. As the P2P business develops, it seems timely to conduct empirical investigation and explore in more depth the phenomenon. Hotel and Airbnb may not be completely comparable from a supplier's perspective, because the nature and size of business is dissimilar. However, from a demand perspective, it is important to compare hotel and Airbnb in order to understand the changing landscape of tourism and hospitality, because consumers regard Airbnb as an alternative to hotel.

83

2. Previous literature

This boom of Airbnb, and by in large in the sharing economy, has attracted attention from academics and researchers in the tourism and hospitality industry. They have started exploring various aspects pertaining to the Peer-to-Peer (P2P) accommodation rental services such as Airbnb. Guttentag (2015), for instance, discussed Airbnb from a disruptive innovation theory perspective. According to this view, products that lack in traditionally preferred attributes but offer alternative benefits can transform a market and capture mainstream consumers over time. Several researchers (e.g., Tussyadiah, 2015) worked on identifying the characteristics of the P2P sharing transactions and its implications. Cheng (2016), for instance, highlighted that the sharing economy empowers people's mobility and encourages traditional tourism service providers to innovate and redefine their business models. Previous research also suggests that the sharing economy has incrementally allowed tourists to have a wide range of products and services at a more reasonable price (e.g., Shaheen, Mallery, & Kingsley, 2012), helped authentic encounters between tourists and locals (e.g., Molz, 2013; Tussyadiah & Pesonen, 2016) and contributed to the employment and income of locals (e.g., Fang, Ye, & Law, 2016). Gutiérrez, et al. (2017) argued that Airbnb expands the tourism pressure over residential areas in the centre.

In addition, several research explored various factors influencing participants' decision. For example, Liang, et al (2017) found that accommodations rewarded with the "Superhost" badge are more likely to receive reviews and higher ratings and guests are willing to pay more for "Superhost" accommodations. Ert, Fleischer, and Magen (2017)'s study found the importance of trust and reputation on guests' decisions by highlighting the role of personal photo in Airbnb. Their study found that a more trustworthy photo leads to a higher price and increased chance to purchase. According to Poon and Huang (2017)'s study, Airbnb is found

108   to be more appealing to people who are allocentric, and when travelling alone, with

109   spouse/partner, and with friends, particularly for longer trips. Others have conducted research

110   from a host's perspective, mostly focusing on pricing issues. For example, Edelman, Luca and

111   Svirsky (2017) found that non-black Airbnb hosts charge approximately 12% more than black

112   hosts for a comparable accommodation in New York City.Wang and Nicolau (2017) found

113   that Airbnb hosts with super host status, more listings, and verified identities usually charge

114   higher prices. Similarly, Gibbs et al. (2017) found physical characteristics, location, and host

115   characteristics significantly impact Airbnb accommodation rates in five metropolitan areas in

116   Canada.

117   Although several studies have explored various topics on P2P platforms for

118   accommodation sharing, few research focused on how P2P accommodation rental services

119   have changed the tourism landscape. In order to understand the true impact of P2P sharing on

120   tourism and hospitality, it is important to understand that market in detail first. Zervas, et al.

121   (2017) tried to estimate the impact of Airbnb on the hotel industry, but their study did not

122   consider seasonality and different locations. Therefore, the next section explors the trends in

123   the Parisian market, the most popular destination for Airbnb guests with more than 40,000

124   accommodation rentals, by comparing their performers by month and by different locations.

125   **3. The Parisian market**

126   Paris is a key destination for Airbnb, where its growth has exploded over the past five

127   year. Airbnb (2015) reported that one third of its guests visit Paris. Moreover, direct Airbnb

128   guest spending in Paris, excluding accommodation, amounted to 980 million euros. As for the

129   income earned by Paris hosts from Airbnb rentals, it reached 213 million euros. But hoteliers

130   in the French capital denounce Airbnb as a menace that enjoys an unfair advantage. Since P2P

131   accommodation rentals, such as Airbnb, have become an increasingly professional operation,

132   French hoteliers are demanding new regulations. For example, in France, the Union of Hotel

133 Industry Trades (UMIH) argued that P2P accommodation rentals are no longer part of the

134 sharing economy and should be taxed and regulated in the same way hotels are. However,

135 Airbnb defends the social aspect of its business, and claims that most Airbnb hosts are long-

136 time Paris residents who predominately share the home they live in. They report that Parisian

137 hosts have, on average, lived in Paris for 19 years and 93% of Paris hosts have only one

138 listing.

139 In Paris, about 60,000 rentals are currently offered via P2P accommodation sharing

140 platforms like Airbnb (Radio Bleu). A recent change in legislation allows French citizens the

141 right to rent their main residence for four months in a year. As a result, in 2015, tourist tax

142 revenue collected from hosts and paid to the city of Paris amounted to €1.2 million in the first

143 three months of operation (Lomas, 2016). In a trend to accommodate the changes introduced

144 by P2P rental platforms, new governmental structures also emerged. In May 2016, for

145 instance, Paris officials created a new section of the city's open data portal that lists residents

146 who have registered as an Airbnb host. Through this portal, residents can report on their

147 annoying neighbour and those hosts who are not playing by the rules. Furthermore, under the

148 new legislation, if a person rents a place through a P2P accommodation platform without

149 being a registered host, she incurs a fine of up to €25,000 (USD 28,000). But while there are

150 more than 41,000 listings in Paris on the Airbnb website, only 126 places of residence are

151 listed as Airbnb sites on the city's website as of May 2016. A Guardian investigation

152 discovered that more than 30% of primary homes in Paris were rented out for more than 120

153 days a year and more than 40% of properties were commercial listings. According to statistics

154 from the Association for Accommodation and tourism professionals (Ahtop: L'Association

155 pour un Hébergement et un Tourisme Professionnels), an estimated 15,000 to 20,000 of

156 accommodations are rented out illegally. Further, Airbnb has been blamed for a marked

157 reduction in the population of Paris. According to research published in French daily Le

158   Parisien, the number of people living in Paris between 2009 and 2014 fell from 2,234,105 to

159   2,220,445. Jean-François Legaret, mayor of the 1st district, said that "The drop in population

160   can be attributed to the Airbnb phenomenon which has been a catastrophe for central Paris,"

161   during the interview with Le Parisien.

162   Paris, the capital and most populous city of France and Europe's main tourist capital,

163   has become a flash point where Airbnb's prosperity, hotelier's anxiety, and local residents'

164   anger collide today. Therefore, in this paper, we explore the development of the Airbnb

165   market over the last seven years in Paris and analyze its relationship with the hotel business in

166   the capital. Also this study examines the market exhaustively by comparing their performers

167   by month and by different administration district in Paris.

168   **4. Data and methodology**

169   To conduct our analysis, we used data from the Paris Convention and Visitors Bureau

170   and Airdna. From the annual reports of the Paris Convention and Visitors Bureau we collected

171   hotel-related performance (e.g., total supply, monthly ADR, monthly occupancy, monthly

172   revenues, revenues and occupancy by Parisian district). This information was available only

173   between 2010 and 2014 as the format of the annual report is different for 2015. We completed

174   the 2015 data with PWC reports available on the Statista website. We would like to note here,

175   that while the data on occupancy rates were the same in the PWC and the annual reports of

176   the Paris Visitors bureau, the ADR was different. For the sake of consistency, we used the

177   ADR from the Visitor's bureau. Airdna supplied data pertaining to Airbnb's activities for the

178   2009-2015 period including: property IDs, type of property, number of bookings per listing,

179   property average daily rate, property occupancy, property revenues. Airdna considers a rental

180   listing to be active if it has been posted in the last 60 days or had a reservation in the last 30

181   days.

182   Three types of accommodations are available on Airbnb: shared room, private room,

183 and entire house/apartment. We calculated the total number of Airbnb rooms by combining

184 the number of private rooms and entire houses. In other words, we excluded the shared room

185 from our computation as we don't perceive this type of accommodation as being a direct

186 competition for a hotel room. Within the same approach, although an entire house may have

187 three bedrooms, we counted all entire houses/apartments as one room because bookings are

188 typically made for an entire house rather than individual bedrooms.

189   Our purpose in this research note is to explore the relationship between Airbnb and

190 hotel supply and demand in the Parisian market. Thus, we focused on contrasting patterns and

191 testing possible interactions. In particular, we conducted time series analysis on monthly hotel

192 and Airbnb ADR and occupancy to empirically investigate the patterns that emerged from the

193 data. Furthermore, we tested the effects of Airbnb total revenues, average ADR and bookings

194 on hotels' total revenues and ADR in linear regression models.

195

196 **5. Research findings**

197 **5.1. A five-year plateau for hosts' profitability?**

198   Table 1 presents a general overview of Airbnb in Paris. In particular, it includes, for

199 the supply data, the number of Airbnb property IDs (i.e. total listings on the platform during a

200 given year), total number of hosts registered, and the total number of Airbnb's private units on

201 the market. In terms of demand, Table 1 presents: average annual ADRs, occupancy rate,

202 average and total number of booking, and total revenues. The supply data presents a

203 predictable pattern: the number of listings has surged since the opening of the platform on the

204 Parisian market with an average annual growth rate of 230% for listings, 226% for the

205 number of private units, and 211% for the number of hosts offering rentals on the platform.

206

207   **Table 1.** The overview of Airbnb listings in Paris (2009 -2015)

Variable	Intercept	Trend	R2
AirBnb	138.91 (P=0.00)	-0.18 (P=0,07)	0.04
Hotel AvgADR	136.63 (P=0.00)	0.63 (P=0.00)	0.26

|	AIRBNB SUPPLY				AIRBNB DEMAND				
	Total Listings	Total Airbnb Private Units	Total Hosts	Average ADR*	Average Occ. Rate	Average number of bookings	Average revenue*	Total bookings	Total Revenue*
2009	66	88	66	140.70	51%	15	11,022	990	727,452
2010	354	440	354	132.66	56%	16	12,226	5,664	4,328,004
2011	1,122	1,399	1,122	128.29	55%	15	11,833	16,830	13,276,626
2012	4,296	5,543	4,292	126.89	55%	13	10,127	55,848	43,505,592
2013	9,536	12,208	9,520	125.42	53%	11	9,153	104,896	87,283,008
2014	18,894	23,772	18,858	121.05	53%	10	8,174	188,940	154,439,556
2015	39,608	48,748	39,415	132.14	49%	7	5,543	277,256	219,547,144

208

209   *In Euros.

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211   The demand side however, shows a different story as the average occupancy has

212   remained relatively stable, and ADR has slightly decreased since the inception of the platform

213   on the Parisian market. Further, results of the time series analysis on monthly ADR are

214   presented in Table 2 with the plots in Figure 1 and show that while Airbnb's ADR has slowly

215   decreased over the examined period, hotels ADR has increased. Moreover, the average

216   annual revenue per listing has been decreasing with the surge in the supply. In other words, as

217   Airbnb gains popularity and its supply increases, the rentals are less profitable for hosts as the

218   average number of bookings per listing has decreased over the past 4 years. This pattern

219   differs from the hotel's one over the examined period in the Parisian market.

220

221   **Table 2.** Time series analysis: Monthly ADR (Airbnb and Hotels)

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226   **Figure 1.** Times series analysis: Monthly ADR (Airbnb vs. Hotels)

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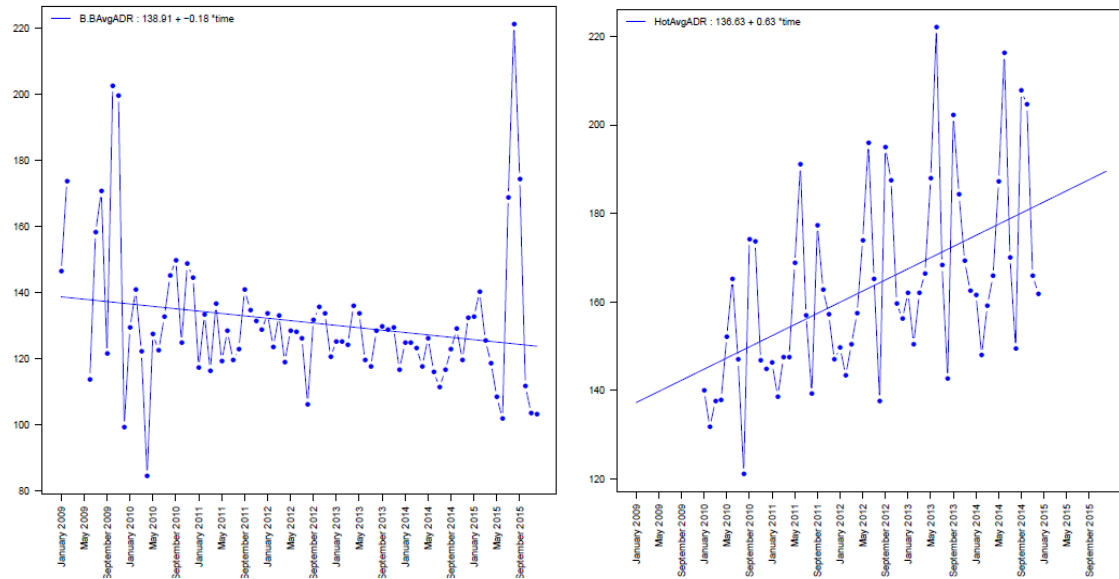
229   **5.2. Growing, but not as expected:**

230   The progression in the supply of Airbnb in total number of listings reflects the

231   exponential growth that has fuelled the debate so far in the industry. Nevertheless, when

232   comparing the annual growth rate to the number of rooms on the Parisian market, it is clear

233   that hotel supply is growing steadily (Figure 2). Again, the Airbnb data reflect a plateau that

234   the platform seems to reach after its first three to four years of operation.

235

236   **Figure 2.** Supply progression of hotel rooms vs. Airbnb listings (2010-2015)
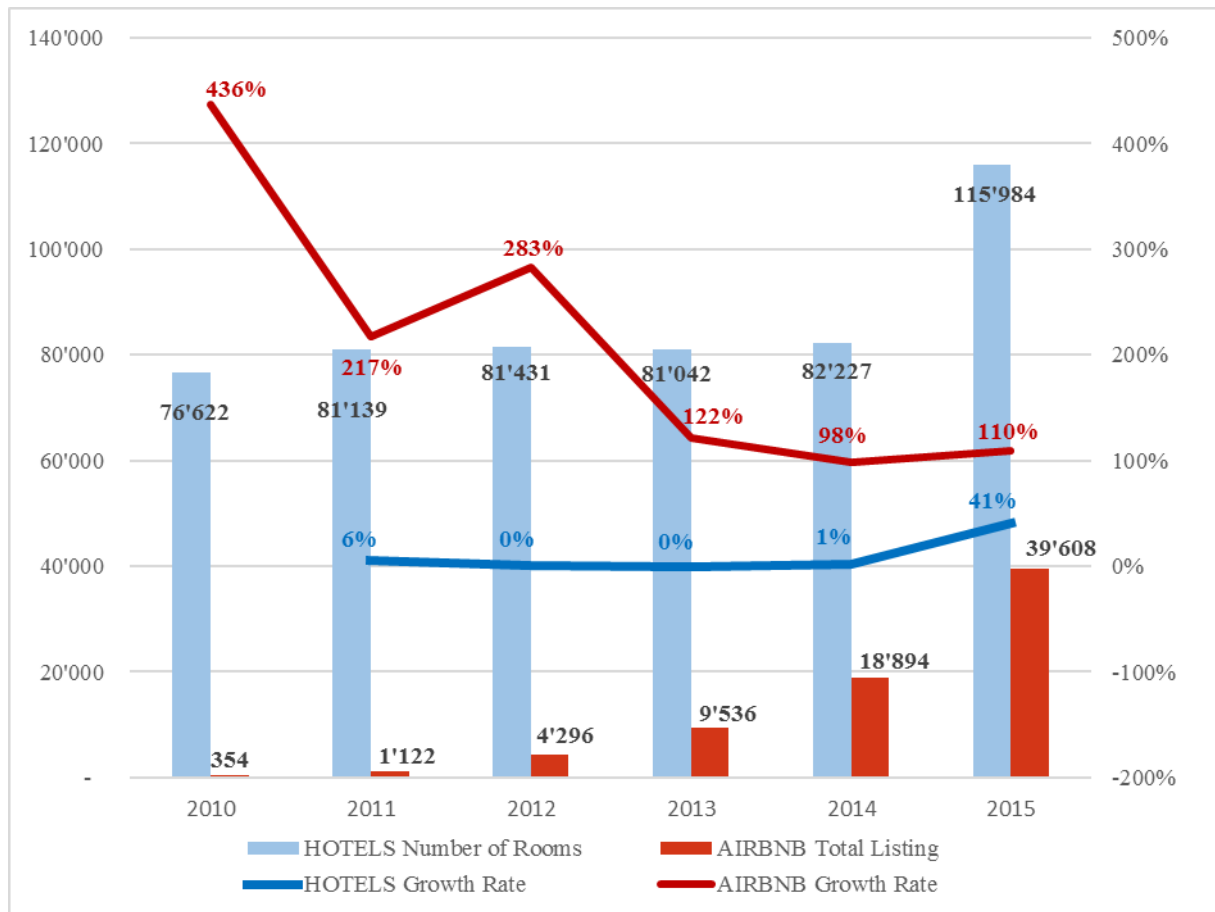
The Parisian hotel market developed between 2010 and 2015, with the opening of

hotels on the higher-end of the offer (Figure 3). Indeed, the number of rooms in the 4*

category has increased by more than 70% and 200% for the 5* segment.

Figure 3. Hotel supply in number of rooms per category of hotel (2010-2015)

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246
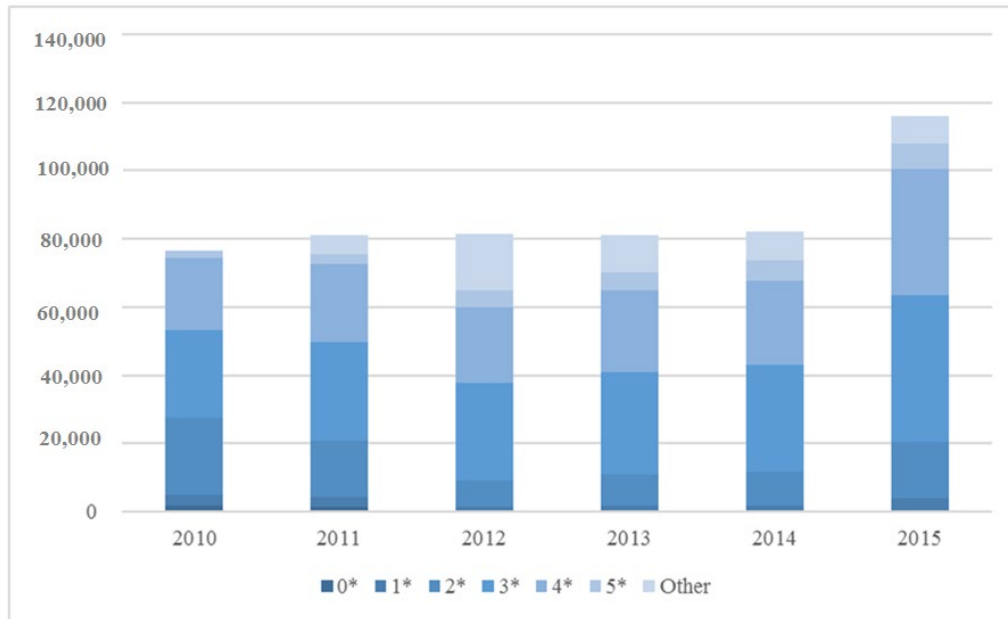
247   In terms of performance, our exploration of the Parisian market reveals that the Airbnb

248   occupancy rate has been far below that of hotels. Figure 4 presents the average occupancy rate

249   across hotels and Airbnb from 2009 to 2015. Blocked days were not included in the

250   occupancy calculation for Airbnb. Hotels maintained a stable occupancy rate of

251   approximately 80% over the period, whereas the Airbnb occupancy stayed around 55%,

252   peaking in 2010 at 55.9%. In fact, Airbnb occupancy has registered a drop since 2012,

253   reflecting the steady increase in the number of listings on the platform. Figure 5 illustrates the

254   results of the times series analysis and reveals that while Airbnb's occupancy has slowly

255   decreased over the period, hotels' has increased (See Table 3 and Figure 5).

256   **Figure 4.** Comparison of occupancy between hotels and Airbnb (2009-2015)
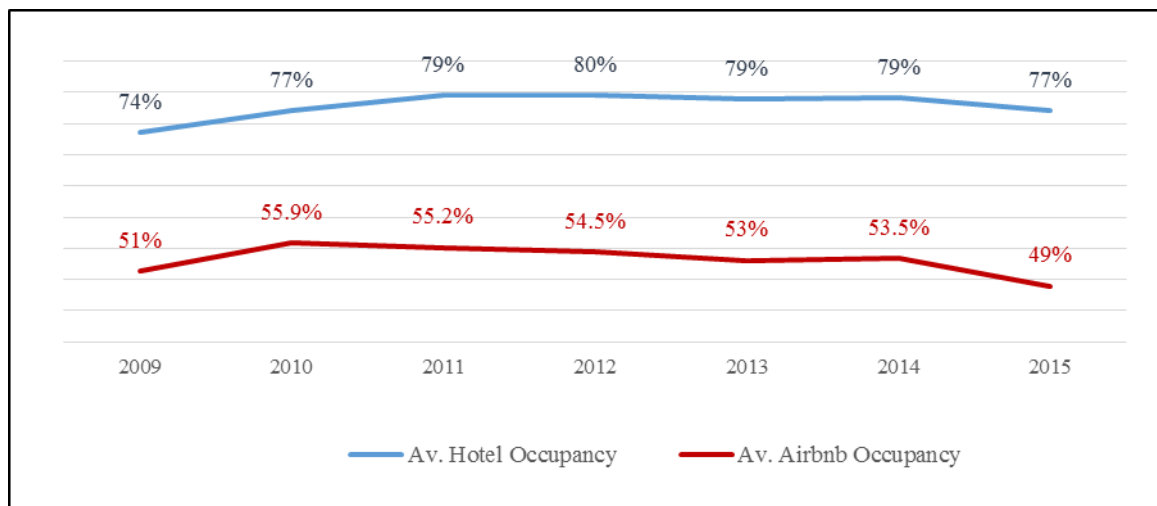
Table 3. Time series analysis: Monthly occupancy (Airbnb and Hotels)

259

Variable	Intercept	Trend	R2
B&B AvgOcc	57.06 (P=0.00)	-0.07 (P=0.00)	0.12
Hotel AvgOcc	74.31 (P=0.00)	0.1 (P=0.02)	0.07

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Figure 5. Time series analysis: Monthly occupancy (Airbnb and Hotels)

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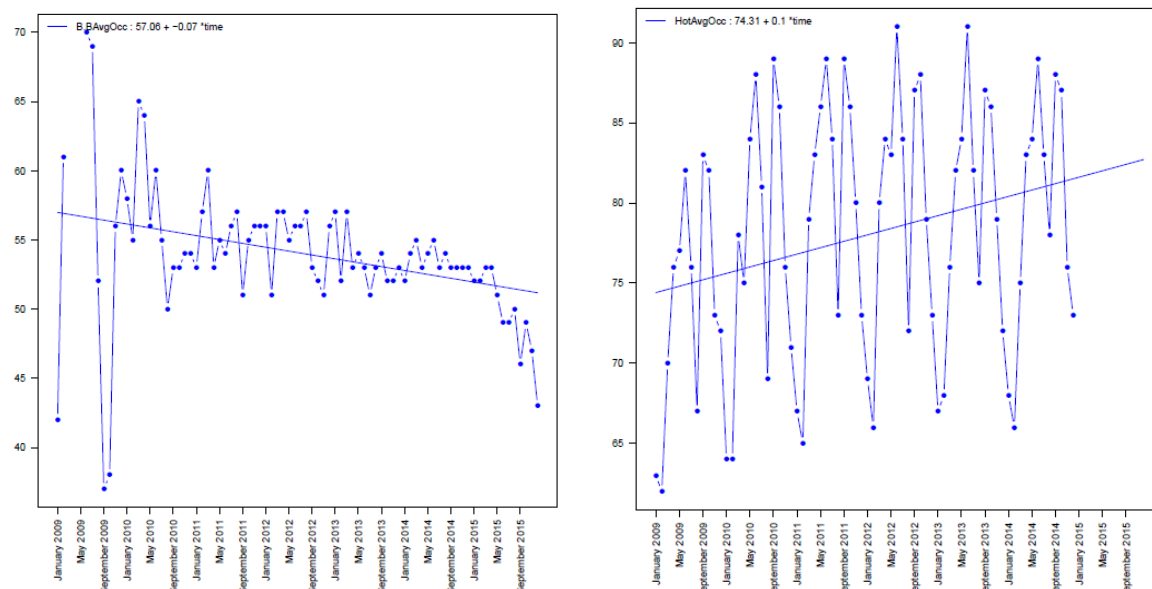
271   In sum, hotels have registered stronger performance in Paris than expected. Their

272 occupancy is stable despite an increase in the supply of 4- and 5-star hotels). As for Airbnb, it

273 boomed in its first 3 years, which is now reaching a plateau in terms of growth rate and

274 profitability for hosts.

275   Further, regression analyses were performance to identify the relationship between

276 Airbnb and hotel performance. According to the result of regression analysis in table 4,

277 Airbnb total revenue has a positive impact on hotel total revenue by month in Paris ($p < 0.01$,

278 adjusted $R^2 = 0.2557$). However, although the coefficient of the number of Airbnb listing

279 showed a negative sign, Airbnb average ADR and total number of Airbnb bookings do not

280 statistically affect hotel total revenue by month in Paris. Similarly, Airbnb total revenue has a

281 positive impact on hotel average ADR by month in Paris ($p < 0.00$, adjusted $R^2 = 0.3238$).

282 However, Airbnb average ADR and total number of Airbnb bookings do not statistically

283 affect hotel average ADR by month in Paris (See table 5).

284

285 **Table 4.** Regression analysis – Hotel total revenue

$\text{HotelTotRev} = \beta_0 + \beta_1 \text{B.BTotRev} + \beta_2 \text{B.BAvgADR} + \beta_3 \text{B.BnbBookings} + \varepsilon$				
	Estimate	Std.Error	t-value	Pr(>|t|)
(Intercept)	6.199e+06	3.465e+06	1.789	0.07898
B.BTotRev	7.342e-01	2.489e-01	2.950	0.00464 ***
B.BAvgADR	2.153e+04	2.671e+04	0.806	0.42357
B.BnbBookings	-1.947e+02	1.259e+02	-1.546	0.12768

286 Note: * p<0.10, ** p<0.05, *** p<0.01

287

288 **Table 5.** Regression analysis – Hotel monthly ADR

$\text{HotelADR} = \beta_0 + \beta_1 \text{B.BTotRev} + \beta_2 \text{B.BAvgADR} + \beta_3 \text{B.BnbBookings} + \varepsilon$				
	Estimate	Std.Error	t-value	Pr(>|t|)
(Intercept)	1.163e+02	3.018e+01	3.854	0.000302 ***
B.BTotRev	6.635e-06	2.168e-06	3.060	0.003397 ***
B.BAvgADR	2.486e-01	2.327e-01	1.069	0.289807
B.BnbBookings	-1.502e-03	1.097e-03	-1.369	0.176432

289 Note: * p<0.10, ** p<0.05, *** p<0.01

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5.3. Different monthly patterns:

Monthly data reflects a yearly uptick in Airbnb listings and uncovers a seasonality in
the Airbnb supply (Figure 6). Figure 6 shows how the number of listings on the platform
peaks in July before dropping in August. This seasonality is increasingly marked, as the total
number of listings has increased over the years. Based on these first findings in the general
view, we further explored the monthly numbers.

Figure 6. Airbnb average listings and average occupancy per month (2009-2015)
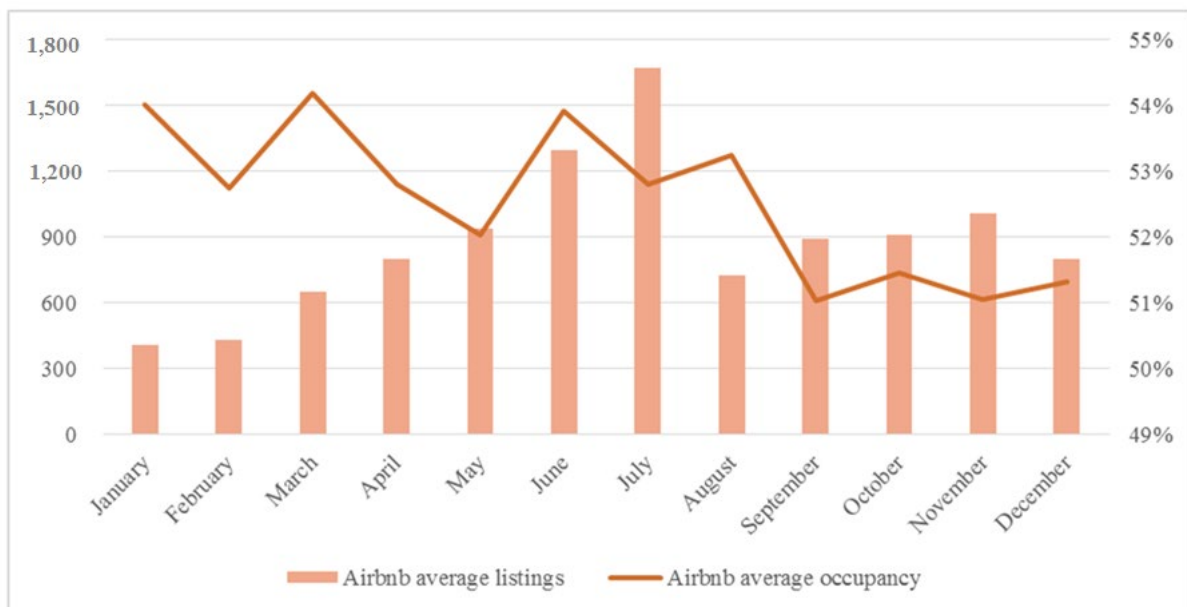
In general, the occupancy rate was higher in March and June each year than in other
months (Figure 6). In 2010, there was a significant fluctuation in the occupancy rate across
the peak season (i.e., March and April) and low season (i.e., August), which were the lowest
occupancy months. In 2014, however, the occupancy rate remained stable over the year.
There are also patterns and seasonality in revenues, with higher revenues seen in the first two
months of the year and then in August. Figure 7 shows the average annual Airbnb revenue in

307 Paris between 2009 and 2015. Starting from 2013, the average annual revenue has started

308 decreasing across the months for the hosts registered on the platform.

309

310 **Figure 7.** Average annual revenue by Airbnb listing (2009–2015)

311
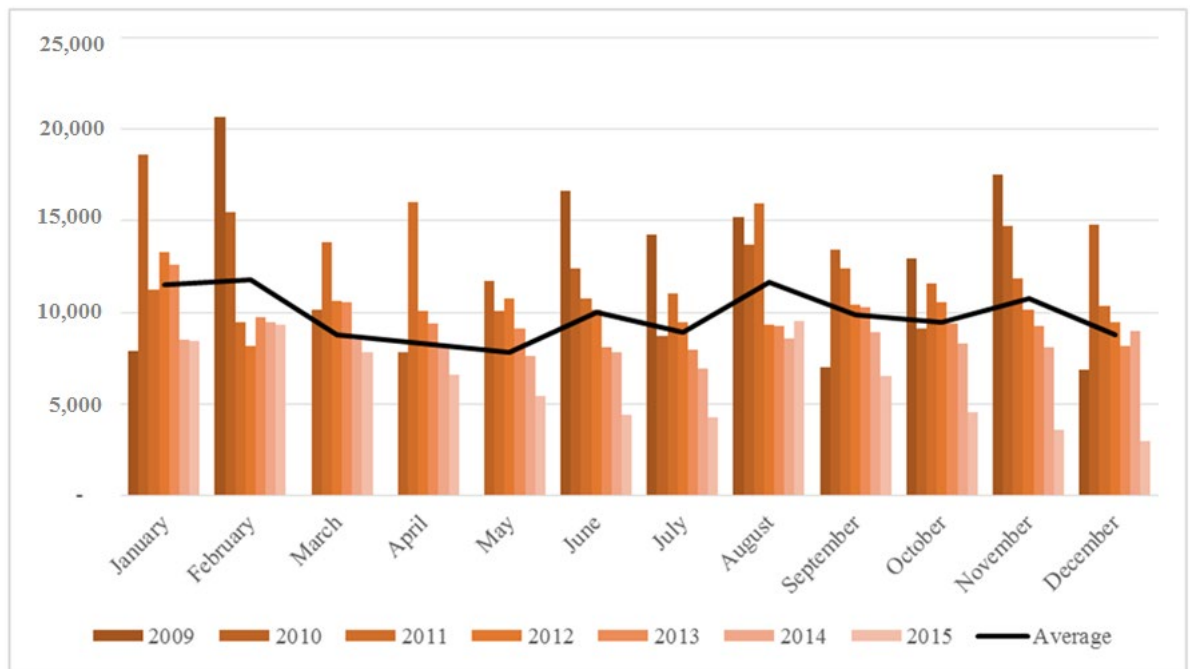
312 Overall, Airbnb shows a relatively stable occupancy rate of between 50% and 55%

313 over the year. Figure 8 compares the occupancy rate in 2014 between hotels and Airbnb.

314 Hotel occupancy, however, fluctuated between 65 and 90% over the year. June and

315 September recorded the highest occupancy rates of 90% and 88%. The occupancy rate

316 remained significantly low throughout the winter season (i.e., December to February). As

317 shown in Figure 9, average ADR by month showed greater variance compared to that of

318 Airbnb.

319 **Figure 8**. Occupancy rates by month Hotels vs. Airbnb (2014)
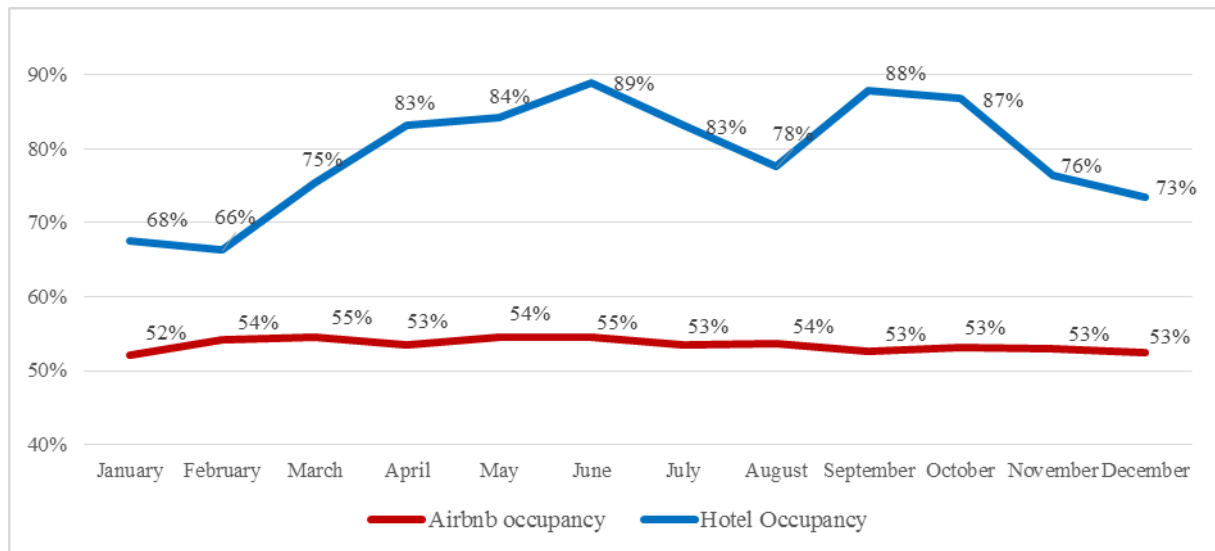
Figure 9. Average ADR: Hotels vs. Airbnb (2009–2015)

5.4. Different geographic patterns.

As Airbnb and hotels appear to show different (and maybe complementary) patterns in supply and demand, we investigated the performance of both products by location. As Paris is divided into twenty administrative districts, we examined whether there are any differences among different districts. Table 6 and Table 7 show the distribution of hotel rooms and Airbnb listings per administrative districts respectively and Figure 10 shows the top five

332 districts in terms of supply of hotel rooms and Airbnb listings in 2014. The locations of hotels

333 and Airbnb properties look quite different. While most hotel rooms are located in districts 9, 8

334 and 17, district 18 and 11 ranked the top districts for Airbnb listings. Both the 18th district and

335 11th district are located on the Rive Droite and the 11th district is the most populated area in

336 Paris.

337 **Table 6.** The distribution of hotel rooms by administrative district in Pars (2010-2014)

Districts	2010	2011	2012	2013	2014
9	11.8%	10.7%	10.6%	10.6%	10.5%
8	11.5%	10.7%	10.5%	10.6%	10.6%
17	9.4%	9.3%	9.1%	9.2%	9.2%
15	8.9%	9.1%	9.0%	8.2%	8.2%
14	8.0%	8.1%	8.1%	8.2%	8.1%
10	7.3%	6.7%	6.8%	6.9%	7.0%
12	5.8%	5.6%	6.0%	5.6%	5.5%
1	5.3%	5.2%	5.2%	5.2%	5.1%
6	5.0%	4.8%	4.7%	4.6%	4.6%
5	3.8%	3.7%	3.7%	3.7%	3.7%
11	3.7%	3.7%	3.8%	4.1%	4.1%
18	3.5%	5.3%	5.5%	5.6%	5.6%
16	3.3%	3.5%	3.4%	3.5%	3.8%
7	2.90%	2.7%	2.7%	2.6%	2.7%
13	2.8%	2.5%	2.6%	2.6%	2.6%
19	2.2%	2.7%	2.7%	2.7%	2.8%
2	2.0%	2.0%	2.0%	2.0%	2.1%
3	1.1%	1.2%	1.2%	1.2%	1.2%
4	1.1%	1.1%	1.1%	1.1%	1.1%
20	0.7%	1.4%	1.4%	1.7%	1.6%

338

339 **Table 7.** The distribution of Airbnb listings by administrative districts in Paris (2009-2015)

Districts	2009	2010	2011	2012	2013	2014	2015
18	15.2%	12.9%	13.1%	13.2%	12.7%	12.5%	11.4%
11	18.2%	11.6%	9.9%	11.0%	10.0%	9.2%	9.0%
15	6.1%	2.5%	4.4%	4.9%	6.1%	7.1%	8.3%
17	1.5%	3.2%	4.6%	4.6%	5.5%	6.7%	6.9%
10	7.6%	6.4%	7.0%	8.3%	7.6%	6.9%	6.5%
16	0.0%	2.0%	2.5%	3.6%	3.8%	4.6%	5.7%
20	3.0%	1.8%	5.3%	5.8%	5.5%	5.8%	5.4%
19	7.6%	1.8%	5.2%	5.2%	5.6%	5.7%	5.1%
9	7.6%	1.5%	4.7%	4.9%	4.9%	4.7%	4.4%
3	12.1%	8.8%	7.5%	6.1%	5.4%	4.6%	4.2%
12	0.0%	3.2%	2.1%	2.6%	3.0%	3.7%	3.8%

13	6.1%	3.8%	2.6%	2.9%	3.1%	3.3%	3.8%
14	0.0%	0.3%	3.5%	2.8%	3.1%	3.1%	3.6%
4	9.1%	10.2%	5.0%	5.5%	4.9%	3.6%	3.5%
5	1.5%	6.2%	4.2%	4.1%	3.9%	3.7%	3.5%
6	0.0%	5.1%	3.7%	3.5%	3.6%	3.3%	3.4%
7	0.0%	5.2%	3.1%	2.4%	3.0%	3.2%	3.4%
2	1.5%	4.2%	4.5%	4.1%	3.5%	3.3%	3.0%
8	1.5%	2.8%	2.9%	2.0%	2.3%	2.4%	2.8%
1	1.5%	6.6%	4.2%	2.5%	2.3%	2.5%	2.0%

Figure 10. Distribution of hotel room supply and Airbnb listing by district: Top 5 districts (2014)
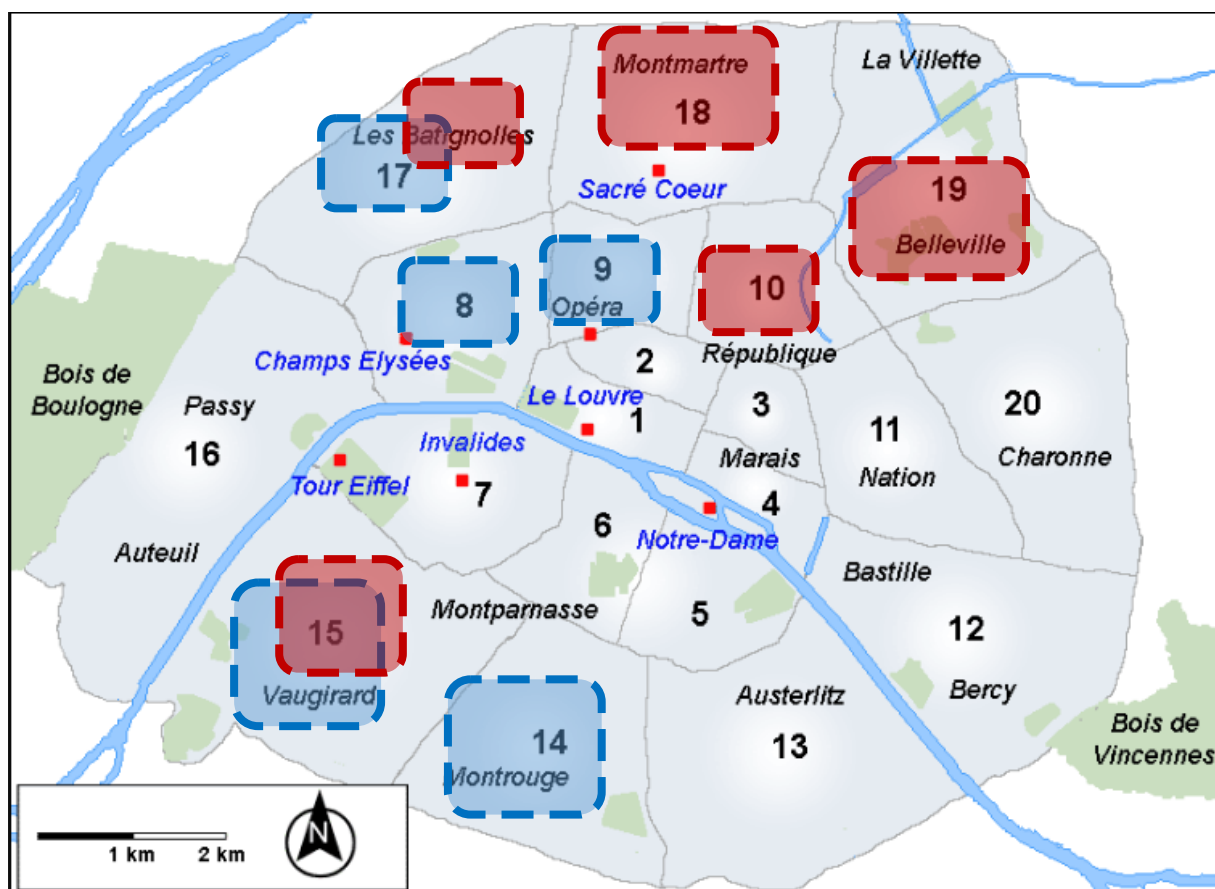
Note: The size of box does not reflect the size of supply.

Further, Table 8, Table 9, Table 10 and Table 11 exhibit the total number of bookings, average occupancy, ADR, and the total revenue of Airbnb by administrative district in Paris. And they show great discrepancies among administrative districts. Again, the 18th and 11th districts rank top districts in terms of the total number of bookings. On the other hand, only

350 4.2% of Airbnb listings in 2015 are located in the 3rd district, but its ADR in 2015 shows the

351 highest ($351.07) and its total revenue ranked third.

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353 **Table 8.** Total number of Airbnb bookings by administrative district in Paris (2009-2015)

Districts	2009	2010	2011	2012	2013	2014	2015
18	90	721	1,958	5,711	11,740	21,826	29,577
11	238	648	1,247	5,985	8,975	14,888	24,361
15	53	137	742	2,883	5,906	12,005	24,244
10	96	357	1,036	4,065	7,840	12,045	19,794
17	7	176	742	1,931	4,559	10,599	17,591
3	65	494	1,799	4,543	8,636	13,656	17,067
4	220	569	1,341	5,664	9,088	10,635	15,068
16	0	113	452	1,983	4,232	9,210	14,659
2	5	234	1,066	2,895	5,427	9,940	13,663
9	52	83	628	1,953	5,446	9,284	12,513
5	53	347	1,070	3,688	5,312	8,390	12,234
6	0	285	629	3,287	5,856	9,165	11,855
19	14	102	376	1,636	3,131	6,904	11,815
20	1	101	463	2,514	3,027	7,254	11,760
12	0	180	264	1,324	2,710	7,007	11,580
7	0	288	602	1,784	4,361	8,182	10,769
14	0	14	470	950	2,723	5,070	10,138
13	75	212	393	1,146	2,033	5,027	9,275
8	11	155	465	1,126	3,440	6,037	9,039
1	0	370	995	2,536	4,110	8,230	8,501

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356 **Table 9.** Average Airbnb occupancy rates by administrative district in Paris (2009-2015)

Districts	2009	2010	2011	2012	2013	2014	2015
11	60.5%	62.5%	54.9%	57.6%	53.6%	55.4%	53.0%
12	0.0%	58.4%	54.6%	58.0%	53.0%	55.4%	51.6%
10	53.8%	63.6%	61.3%	55.4%	54.3%	54.8%	51.6%
13	52.7%	60.8%	57.5%	57.0%	48.1%	52.8%	50.9%
5	77.8%	65.4%	61.1%	60.4%	56.6%	56.3%	50.7%
20	29.4%	53.8%	54.2%	55.4%	51.7%	52.4%	50.7%
2	40.5%	56.9%	61.1%	53.5%	56.0%	54.5%	50.5%
14	0.0%	31.5%	52.6%	48.6%	49.0%	53.2%	50.0%
1	0.0%	68.2%	59.0%	55.2%	56.6%	57.9%	50.0%
4	66.6%	61.9%	57.0%	60.7%	54.5%	57.0%	49.5%
3	50.3%	61.7%	56.8%	53.6%	53.6%	55.1%	49.4%

15	47.9%	52.6%	53.2%	55.6%	53.8%	52.8%	49.0%
18	26.0%	51.6%	52.9%	52.5%	51.9%	51.8%	48.3%
19	45.1%	38.8%	46.0%	47.7%	51.2%	49.5%	48.2%
9	59.9%	36.7%	48.9%	51.4%	51.9%	52.2%	48.2%
17	30.9%	50.8%	53.8%	50.5%	51.7%	50.5%	47.3%
6	0.0%	63.9%	55.2%	54.3%	57.4%	53.4%	47.1%
7	0.0%	61.7%	56.1%	58.6%	54.2%	54.9%	46.3%
8	78.1%	41.3%	48.6%	47.1%	51.6%	52.9%	44.1%
16	0.0%	43.5%	54.6%	50.2%	50.2%	51.5%	42.8%

Table 10. ADR of Airbnb listings by administrative district in Paris (2009-2015)

Districts	2009	2010	2011	2012	2013	2014	2015
3	157.97	112.67	149.22	143.37	154.60	147.01	351.07
8	109.29	216.06	236.85	184.59	179.01	228.52	258.06
4	248.10	202.43	154.80	152.36	167.52	155.41	162.27
6	0.00	177.99	190.80	163.12	180.42	175.06	160.74
1	0.00	161.65	152.04	169.32	160.46	174.74	155.64
7	0.00	159.36	161.44	159.53	168.86	178.44	151.53
16	0.00	139.26	186.02	145.76	158.63	142.02	141.80
11	108.75	123.71	108.26	109.33	107.12	100.13	141.04
18	132.89	102.79	105.90	105.96	96.46	99.80	139.33
2	127.84	116.18	131.09	158.38	145.98	147.75	133.46
5	81.39	131.90	141.29	140.18	151.73	133.23	123.98
9	102.27	103.88	111.62	135.33	125.98	121.31	111.70
10	106.48	90.75	106.61	113.94	109.88	103.90	101.44
17	200.48	138.68	152.32	125.83	104.09	111.98	99.85
15	240.95	151.52	119.10	129.14	118.72	110.48	99.60
14	0.00	170.18	101.74	122.05	112.97	98.50	95.28
12	0.00	116.17	102.73	111.12	102.84	98.51	84.22
13	112.66	93.69	91.47	102.67	96.01	88.36	79.24
19	98.69	113.14	87.87	89.45	86.49	84.35	72.30
20	49.00	87.53	75.77	82.38	79.81	79.15	69.43

Table 11. Total Airbnb revenue by administrative district in Paris (2009-2015)

Districts	2009	2010	2011	2012	2013	2014	2015
18	34,511	320,824	925,446	2,548,882	4,860,132	8,599,536	14,605,641
11	106,828	385,063	744,751	3,090,023	4,555,431	7,290,694	14,270,196
3	60,409	205,388	1,158,811	2,770,841	5,630,981	8,366,997	10,970,884
8	23,061	82,924	468,068	903,665	2,389,453	4,855,422	10,859,226

15	54,518	122,833	410,228	1,663,065	3,374,646	5,767,255	10,789,337
10	38,984	149,253	540,204	2,254,394	3,790,746	5,582,234	8,965,158
4	162,261	414,621	1,004,010	3,553,774	6,350,456	6,816,409	8,957,465
16	0	85,021	394,833	1,124,265	2,730,892	5,610,700	8,763,469
6	0	251,799	510,613	2,139,217	4,634,925	6,716,866	8,310,219
17	5,814	164,409	493,205	1,147,232	2,133,513	5,563,926	7,222,883
2	4,347	131,380	562,278	1,886,284	3,330,829	5,694,461	6,900,639
5	13,103	236,766	710,161	2,122,373	3,390,609	5,404,353	6,569,106
7	0	171,789	406,427	1,356,666	2,968,147	6,037,727	6,315,285
9	23,047	44,576	314,930	1,088,747	2,856,614	4,069,873	5,647,928
1	0	213,209	688,445	1,669,338	2,749,892	6,169,312	5,563,077
14	0	13,725	211,468	676,715	1,621,498	2,418,366	4,012,151
12	0	87,103	138,557	571,505	1,408,532	3,020,042	3,839,533
20	245	30,688	221,688	802,797	1,218,812	2,551,314	3,492,541
19	8,192	62,916	167,076	661,022	1,337,245	2,454,472	3,485,952
13	37,818	90,127	211,724	609,537	818,245	1,910,055	2,917,353

6. Discussion

As Airbnb registers booming numbers in the world, and in Paris in particular, it has fuelled heated discussions and fear amongst hoteliers. Moreover, as the impact of new businesses in the sharing economy, such as Airbnb, spans beyond the competitive and economic aspects, it is imperative at this stage to start examining the phenomenon in more depth. As such, the purpose of this research notewas not to calculate the extent of the impact of Airbnb on hotel businesses in Paris but to explore the intricate relationship between the Airbnb and hotel markets in Paris. We trust that it is an essential first step for future complementary empirical studies. We therefore explored the monthly data as well as the geographical distribution of Airbnb business across the Parisian districts. We hope that such an investigation will spark discussion about the direction for future research.

In particular, while our findings confirm that the volume of activity on the Airbnb platform is booming, they also show that performance results are mixed. The average occupancy has reached a plateau, ADR is slightly decreasing and profitability for hosts is dropping. Future research could explore the determinants of such patterns and their

380 relationship, if any, with hotel's drivers of performance. In terms of the competitive threat that

381 it can represent, our study shows different growth and seasonality patterns for Airbnb and

382 hotels and dissimilarities in the geographical location of the offers. As Airbnb has boomed in

383 Paris since its launch in 2009, the hotel business has also remained solid with an increase in

384 supply and ADR. As for the seasonality patterns, they also differ for hotels and the platform

385 as the latter manages fluctuating and seasonal supply. Finally, due to the difference in the

386 nature of product offered, the location reflects the dissimilarities between P2P rentals and

387 hotels. In sum, this exploration indicates that the two products are not in direct competition

388 and that their relationship might be more complex than previously thought. We trust that

389 exploring the nature of the competitive relationship (i.e., the impact of P2P accommodation

390 rentals on the hotel business) would be a valuable avenue for further investigation. Although

391 non-significant, the signs of the coefficients in the regression analyses point towards a

392 different relationships between Airbnb and Hotel for the demand and supply sides. Future

393 empirical investigations, could separate the demand from the supply effects of Airbnb on

394 hotel sales performance.

395   Future research could, for example, investigate whether these platforms are substitutes

396 or complements to the hotel offering. Indeed, the fact that Airbnb needs to also manage hosts'

397 expectations and fluctuating demand reflects the specific nature of the accommodation

398 landscape. Similarly, the annual occupancy rate of Airbnb has been far below that of hotels

399 and its occupancy rate has been relatively stable at 50-55% over the years. Interestingly,

400 however, the average occupancy of hotels fluctuated between 65% and 90% over the year.

401 July is the off season for Airbnb, whereas February is the lowest for hotels. This difference

402 may indicate that the clientele for Airbnb is not the same as hotels. In fact, while hotels have

403 seen their occupancy rates and bookings drop since the terror attacks in Paris, Airbnb and

404 HomeAway-Abritel have been doing well. Travel across France fell during the summer of

405   2016 in the aftershock of deadly attacks that shook Paris and Nice, even as the European

406   soccer championship drew hundreds of thousands of fans to games held throughout the

407   country. However, according to Airbnb, 3.6 million people stayed in an Airbnb

408   accommodation in France between June and August 2016, which is 86 percent more than a

409   year earlier (Weiss, 2016). Therefore, it is difficult to say that Airbnb took all business from

410   hotels in Paris. Furthermore this finding converges with newly developed knowledge in other

411   markets (Dogru, Mody, & Suess, 2017).

412   Contrary to popular belief and despite the surge of Airbnb listings, the findings of this

413   research paper reveal nuances in Airbnb's impact on the tourism market in Paris. In line with

414   the notion of disruptive innovation, our exploration suggests that services such as Airbnb

415   offer opportunities for travellers who would otherwise not have been able to travel. Therefore,

416   the impact of Airbnb may vary across hotel markets. Also, our findings indicate that such

417   services can benefit the tourism market as P2P seasonality patterns could complement those

418   of hotels. Further investigation into the impact of sharing accommodation platforms on

419   overall tourism demand could explore this complementarity to find the true impact of P2P

420   accommodation rental services on the hotel industry.

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