Hotels that most rely on Booking.com – online travel agencies (OTAs) and hotel distribution channels

Eva Martin-Fuentes and Juan Pedro Mellinas

Abstract

Purpose – *The purpose of this paper is to know which hotels mostly rely on Booking.com, investigating the level of presence on Booking.com around the world by country, hotel size, hotel category and managerial form. Neither the company nor the hotels provide this information, so the authors use the number of reviews as an indicator of estimated sales.*

Design/methodology/approach – *Data from 33,996 hotels worldwide are downloaded from Booking.com using a Web browser automatically controlled, developed in Python, that simulated a user navigation (clicks and selections). The comparison between independent hotels and hotels belonging to a chain is performed by a Student's t distribution test and the comparison of hotel categories and hotel size is analyzed by a one-way ANOVA test.*

Findings – *The results show that three factors clearly influence the usage level of Booking.com: independent vs chain hotels, small vs large hotels and low vs high category hotels worldwide. The authors also observe that hotels from Europe are the ones that rely more on Booking.com.*

Originality/value – *The originality of this research is to identify the factors that make hotels to have a greater (lesser) dependence on Booking.com within each destination and geographical area. Moreover, the use of big data from hotels worldwide allows the authors to know the level of use of Booking.com in dozens of countries, especially those with the highest tourist activity. This work expands the capabilities of big data in the hospitality industry research, and with a simple ratio, this study counteracts the lack of public data on hotel sales through Booking.com. This new approach could be extended to the analysis of other online travel agencies (OTAs), which use similar review systems.*

Keywords Hotel, Big data, Booking.com, OTA, Reviews, Rooms

Paper type Research paper

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1. Introduction

The emergence of the internet since the 1990s has been transforming the way that products and services are distributed to customers around the world (Berne *et al.*, 2012). The hotel sector has been one of the most affected by this new way of selling its services, becoming an essential channel in the selling strategy of any accommodation business in the world.

In this study, we focus on investigating the level of presence of Booking.com, the main online travel agency (OTA) for the commercialization of hotels worldwide, in different countries and types of hotels. We can easily know the number of establishments that this website offers in each destination, but we know almost nothing about the sales of these establishments using Booking.com, neither in absolute numbers, nor as a percentage of their distribution mix. This data is especially difficult to obtain from the hotels or from Booking.com, as it is very sensitive economic information.

To estimate the number of reservations made through Booking.com in a hotel, we based our findings on the number of reviews registered in each establishment. After their trip, guests

receive an email inviting them to write about their stay (Booking, 2017a). This is the only way to leave a review on Booking.com.

We must consider that not all guests who receive the Booking.com email inviting to write a review, collaborate with the company, but we assume that customers have a constant probability of posting a review on Booking.com. It means that the number of reviews is expected to be closely correlated to the number of room sales. Therefore, the number of published reviews on Booking.com might be taken as a proxy for sales of a hotel's rooms through this travel agent.

This methodology has been used before, using Amazon.com's sales rankings to infer product sales (Chevalier and Mayzlin, 2006; Ghose and Ipeirotis, 2006), others focusing on the relationship between the number of reviews of online games and the sales of online games (Zhu and Zhang, 2010) or on the relationship between reviews and book sales (Forman *et al.*, 2008).

In the hotel industry, a research with data from Booking.com assumed that the number of hotel reviews is a constant fraction of sales for all the hotels (Öğüt and Onur Taş, 2012). Ye *et al.* (2008) considered the number of online reviews as a proxy for hotel sales (in Ctrip.com and Elong.net) and validated their approach with a 19 hotels sample. Results showed a significant positive relationship between the number of reviews and the number of hotel bookings with an R-square of 68 per cent. These authors wrote a new paper assuming this relationship and validating it again with a 27 hotels sample from Ctrip.com. In this case, they got a R-square value of 44.1 per cent (Ye *et al.*, 2011). These three papers have had some popularity among the scientific community with 148, 32 and 589 citations, according to Google scholar.

This relationship between hotel reviews and sales has only been tested in two small samples of Chinese hotels, so its accuracy and validity has been questioned (Schuckert *et al.*, 2015). However, several authors have developed their research based on its validity as a reliable proxy (Lu *et al.*, 2012, 2014; Viglia *et al.*, 2014). Recently, this methodology was used to determine the level of dependency of Spanish hotels on Booking.com, establishing a relationship between the number of reviews collected in a year and the number of rooms in each establishment, defining a ratio called reviews per room (RpR) (Mellinas, 2017).

We use this ratio as a proxy of the level of use of Booking.com by hotels: a greater RpR will indicate a greater percentage of reservations through this website. If a hotel has twice the RpR than another, it will be because its percentage of sales through Booking.com is double that in the other.

Using this ratio, we carry out a worldwide study on Booking.com. First, we identify the level of importance of Booking.com in dozens of countries around the world, especially those with the highest tourist activity worldwide. Second, we identify the factors that make hotels, individually, have a greater or lesser dependence on Booking.com within each destination and geographical area. The results obtained highlight different profiles of hotels that have a greater tendency to use Booking.com.

1.1 Booking.com

There are two companies that dominate hotel distribution in internet worldwide. On one hand, Expedia (Expedia, Hotels.com, Orbitz, Travelocity, Hotwire, Wotif, etc.), and on the other, Priceline, which uses six primary brands: Booking.com, priceline.com, agoda.com, KAYAK,Rentalcars.com and OpenTable (Priceline, 2017). Booking.com accounts for more than two-thirds of total revenue in the group (Levy, 2013) and is the world leader in booking accommodations online. It is the leading OTA in most European countries with 62 per cent of global market share (Schegg, 2016). The website is available in 43 languages, offers over

1,300,000 accommodations and covers over 100,000 destinations in 220 countries and territories worldwide.

Booking.com is also a huge reviews database that features over 140 million verified reviews written by guests after their stay. These reviews have a numerical part on a scale of 2.5-10 (Mellinas *et al.*, 2015) and a qualitative part referring to the text that users voluntarily write. Booking.com has got a clear leadership position in the number of reviews, when we compare it with other OTAs, hosting 39 per cent of all reviews worldwide (Murphy, 2017) and probably a higher percentage if we focus on the European market.

Although Booking.com is based in Amsterdam (Priceline bought the company in 2005) and was primarily focused on the European market, in recent years, it has faced an expansion worldwide, for example in the USA (Booking.com, 2013). In this market, it enters into an apparent direct competition with Priceline, which is focused on the North American market. But both companies seem to operate in an autonomous way; Booking.com is the world's top hotel-reservation service, while Priceline is the leading provider of discount-travel services in the USA (Levy, 2013).

2. Literature review

Academic researchers have been focusing on online distribution as alternative to increase reservations, revenue and profit (Pal and Mishra, 2017; Talluri and Van Ryzin, 2006). Some players in the distribution network, gain power, which may lead to dependencies, particularly in OTAs, especially those which belong to the cited Expedia and Priceline groups (Pearce, 2008). OTAs have had a profound effect on the way that hospitality industry works (Buhalis and Law, 2008), offering a vast amount of opportunities and alternative distribution systems (Toh *et al.*, 2011). Although both traditional travel agencies and OTAs are equally important at present and have similar shares, the role of the former will inevitably decline in the coming years (Law *et al.*, 2015).

OTAs help hotels to sell their services, but reducing incomes because of commissions (Carroll and Siguaw, 2003; Ford *et al.*, 2012). The average commission charged by Booking.com or Expedia is more than 18 per cent of the price (Garrigos-Simon *et al.*, 2017), and hotels have some other costs with virtual operators: direct fraud, no shows, cancelations or non-conversion rates. It was assumed that the importance of intermediaries would decrease (Bennett and Lai, 2005; Tse, 2003) and direct channels (hotel website, social media, hotel App) would increase its market share (Ip *et al.*, 2011), mainly because of the commission charged by OTAs. However, direct bookings have reduced, while OTAs share has been increasing in levels around 25 per cent (Schegg, 2016) or 40 per cent (European Commission, 2017) in the European market.

These research from the European trade association of hotels (Schegg, 2016) showed that one player (Booking.com) controls closely two-thirds of the OTA market, which means a Booking.com market share of around 15 per cent. Additional data about "OTA market shares by segment" are provided by the cited research, showing figures of 23.4 per cent for independent hotels and 19.9 per cent for hotel chains. Similar differences between independent hotels and chain hotels can be observed in the report published by the European Union competition authorities (European Commission, 2017). Also, variations by hotel category (from 33.5 to 17.0 per cent) and additional differences by hotel size (from 27.5 to 17.6 per cent) are identified.

During the past years, hotel reviews databases have gained great importance, generating a large number of publications on this topic, as a valuable source of information for academic researchers and hoteliers (Cantallops and Salvi, 2014; Kwok *et al.*, 2017). Whenever applicable, researchers are replacing the data sets collected through questionnaires and interviews by those collected from online services, with Booking.com and TripAdvisor being the most prominent sources (Stanisic, 2016). The increased use of big data collected from

online review websites for research purposes is supported by automatically controlled systems, which acquire information of about millions of reviews from thousands of hotels (Radojevic *et al.*, 2015) quickly, cheaply and conveniently. Once this huge databases are obtained, researchers have attempted to analyze and understand online traveler reviews by sophisticated technologies (Govers and Go, 2004; Ye *et al.*, 2009a, 2009b).

We could consider Booking.com as a relevant example of crowdsourcing or crowd voting for the hospitality industry (Garrigos-Simon *et al.*, 2017). Crowdsourcing can be used to improve the design and installations of hotels to reduce product defects and room maintenance issues in hotels. Moreover, hotels can develop new models of product and service excellence, personalization and authenticity (Richard *et al.*, 2016). Mellinas *et al.* (2015) identified 12 papers using Booking.com reviews database as a source of information. Since then, papers have not stopped appearing academic papers dealing with hospitality issues and using Booking.com hotel reviews (Abrate and Viglia, 2016; Borges *et al.*, 2015; Díaz and Rodríguez, 2017; Mariani and Borghi, 2018; Martin-Fuentes *et al.*, 2018; Mellinas *et al.*, 2016; Radojevic *et al.*, 2015, 2017).

Motivations behind writing and sharing online reviews have been discussed in the academic literature (Hennig-Thurau *et al.*, 2004; Schuckert *et al.*, 2015). Some authors argue that contributors are mostly driven by intrinsic and positive motives such as enjoyment, positive self-enhancement concerns for other consumers or wanting to help the company rather than vengeance and the need to vent (Yoo and Gretzel, 2008). This altruistic phenomenon is considered an online reproduction of similar phenomena of friendliness and collaboration that exist in the offline or "real world" (Resnick and Zeckhauser, 2002).

Products and services reviews on the internet show the best and the worst of people (Whitty and Joinson, 2008). On the one hand, anonymity favors users to give more honest opinions. But on the other hand, that anonymity encourages some users to lie more than they would in real life. They are a way to show complaints after an unsatisfactory hotel experience (Chiappa and Dall'Aglio, 2012). The motivation for posting negative reviews ranges from taking revenge to warning others (Wetzer *et al.*, 2007).

This could suggest reviewers are much more likely to post reviews if they are extremely satisfied or disappointed. Previous research using Booking.com showed a very small percentage of travelers to be extremely disappointed. After analyzing 662,991 reviews, Booking.com scores were infrequently low, with more than 80 per cent of review scores being higher than 6.0 and only 2 per cent under 4.0 (Bjørkelund *et al.*, 2012).

3. Methodology

Data for this study were collected using a Web browser was automatically controlled, developed in Python that simulated a user navigation (clicks and selections) for Booking.com.

We automatically gathered the number of reviews, ranking and scoring, hotel name, city, country, hotel category, number of rooms, if the hotel belongs to a chain or if it is independent and date from which hotels start to work with Booking.com, corresponding to the top destinations in the world according to TripAdvisor ranking. The ranking was downloaded by the ratings of "All reviewers" option, and we have taken only hotels into account discarding other options such as apartments, villas or hostels.

Having obtained 40,580 hotels on Booking.com, we discard those that were in Booking.com for less than 12 months to avoid possible bias, so we analyze a total of 33,996 hotels as shown in Table I.

Table I Data sample	
Booking.com	*Number*
Countries	66
Destinations	441
Hotels	33,996
Total reviews	17,854,988
Min. review	5
Max. review	18,115
Source: Compiled by the authors based on data from Booking.com	

We divide the data set into regions, namely, America (AME), Asia and Pacific (ASP), Europe (EUR) and Middle East and Africa (MEA), as suggested in other researches (Banerjee and Chua, 2016; Martin-Fuentes, 2016).

The statistical calculations were performed using SPSS Software, version 20.

To quantify the RpR, we use a simple index obtained by dividing the number of reviews on Booking.com for a given hotel by its number of rooms (Mellinas, 2017). As Booking.com only keeps in its website the reviews provided by users for the past 24 months, the RpR was divided by two to obtain the RpR per year. For those hotels that were on Booking.com for less than 24 months, that period on Booking.com was transformed to the equivalent number of years (i.e. 18 months 1.5 years).

As we were working with a large volume of data, applying the central limit theorem, the population of sample mean was assumed to be normal.

To compare the RpR by independent hotels or hotels belonging to a chain, we performed a Student's t distribution test.

To compare the RpR by hotel categories, the one-way ANOVA test is performed to determine whether there are any significant differences between the RpR mean on Booking.com according to the hotel category (1 to 5 stars). It tests the null hypothesis:

H0. $\mu_1 = \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5$ being μ_n, the RpR mean by hotel category (n = 1, 2, 3, 4, 5).

H1. There are two or more groups' means that are significantly different from each other.

The comparison of the RpR mean by hotel size, a one-way ANOVA test is performed in three groups: small (from 1 to 20 rooms), medium (from 21 to 80 rooms) and large (more than 80 rooms).

4. Results

The results are presented to confirm or reject the comparison of RpR mean on Booking.com according to the managerial form (independent hotel or chain), the hotel category, the hotel size and the region where the hotel is located.

An additional analysis, looking for a possible relationship between RpR and hotel scores obtained on Booking.com was also performed. The results offered a low Pearson correlation coefficient ($\rho = 0.15$), the highest correlation coefficient was in ASP ($\rho = 0.28$) and the lowest in EUR ($\rho = 0.02$).

4.1 Reviews per room by independent hotels versus chain hotels

To check the mean comparative for RpR between independent hotels and hotels belonging to a chain, a Student's t-test was performed with independent samples of variables, as the hotels were not the same.

The results allowed us to reject the null hypothesis that the RpR means were equal on both type of hotels, so we confirmed that RpR mean in independent hotels was higher than on those belonging to chains ($t = 1.99$, $df = 33893$, $p < 0.001$). Table II shows the highest RpR mean for the independent hotels.

By regions, we confirm that independent hotels have a higher RpR mean than those belonging to a chain; the results in all cases were statistically significant ($p < 0.001$). The highest RpR mean difference is shown in hotels from Europe ($t = 2.7$, $df = 15,595$, $p < 0.001$), which confirm that independent hotels receive more guests from Booking.com than hotels belonging to a chain, as can be observed in Table III, those surely have less dependency on OTAs.

4.2 Reviews per room by hotel category

To check the equality of variances, i.e. homoscedasticity, Levene's test was performed and the assumption of homogeneity was not met because [$F(4, 29{,}811) = 645.47$, $p < 0.001$]. As the assumption of homogeneity of variance was not met for this data, we used the obtained Welch's adjusted F ratio [$F(4, 5{,}155.48) = 627.31$, $p < 0.001$]. We can conclude that at least two of the five hotel category groups differ significantly in their average RpR.

Then, analyzing in-depth each hotel category determined by the hotel stars (from 1 to 5), the mean comparison was performed by an ANOVA test post hoc Games–Howell (not homogeneity of variance and not the same groups sizes), and the results show that the higher the category is, the lower the RpR gets. All results are statistically significant, except the RpR of hotels of 1- and 2-stars ($p = 0.07$), which confirm in these two groups (1-star and 2-star hotels) that there is no significant difference.

The results confirm that hotels with highest categories sell fewer rooms through Booking.com; otherwise, hotels with the lowest categories have bigger dependency on Booking.com

Table II	Descriptive statistics of RpR between independent hotels and chain hotels				
Type	N	Mean	SD	Minimum	Maximum
Independent	27,322	5.47	7.06	0.01	86.22
Chain	6,573	3.49	4.18	0.01	40.89
Source: Compiled by the authors based on data from Booking.com					

Table III	Descriptive statistics of RpR by regions				
Types by region	N	Mean	SD	Minimum	Maximum
AME					
Independent	5,272	4.03	5.11	0.02	78.46
Chain	1,729	2.13	2.69	0.01	37.95
ASP					
Independent	8,364	2.71	4.37	0.01	69.67
Chain	1,472	1.61	2.14	0.01	21.83
EUR					
Independent	12,619	8.08	8.35	0.01	86.22
Chain	2,978	5.38	4.98	0.02	49.89
MEA					
Independent	1,067	3.40	4.38	0.01	40.63
Chain	394	2.13	2.15	0.05	13.61
Source: Compiled by the authors based on data from Booking.com					

because they have more reviews, as shown in Table IV. Except between 1-star and 2-stars hotels among which there is no mean difference.

4.3 Reviews per room by hotel size

The rooms are grouped into three categories to classify the hotel size: small (from 1 to 20 rooms), medium (from 21 to 80 rooms) and large (more than 80 rooms).

To check the equality of variances, i.e. homoscedasticity, Levene's test was performed and the assumption of homogeneity was not met because [$F(2, 33,892) = 2,816.69$, $p < 0.001$]. As the assumption of homogeneity of variance was not met for this data, we used the obtained Welch's adjusted F ratio [$F(2, 15,176.69) = 2,434.02$, $p < 0.001$]. We can conclude that at least two of the three hotel sizes' groups differ significantly in their average RpR.

Then, analyzing in-depth each hotel category determined by the hotel size, the mean comparison was performed by an ANOVA test post hoc Games-Howell (not homogeneity of variance and not the same groups sizes), and the results show that the higher the category is, the lower the RpR gets as can be observed in Table V. All results are statistically significant.

A one-way ANOVA post hoc Games-Howell test was performed, and the results show that the smaller the hotels are, the higher the RpR is, showing that in all cases the difference is statistically significant ($p < 0.001$).

By regions, there are also significant differences in RpR means, with an ANOVA test taking as a group each region, the regions with a higher RpR are EUR, AME, MEA and ASP.

The results by regions show the same pattern, the smaller the hotel is, the higher the RpR is, as can be seen in Table X with the ANOVA test, and showing that all the results are statistically significant ($p < 0.001$) Table VI.

The results by managerial form and hotel size, show the same pattern, the smaller the hotel is, the higher the RpR is, as can be seen in Table VII with the ANOVA test, and showing that all the results are statistically significant ($p < 0.001$) in all cases.

Table IV	Descriptive statistics of RpR by hotel category				
Categories	N	Mean	SD	Minimum	Maximum
1-star	892	7.52	9.76	0.06	83.50
2-stars	4,270	6.35	8.33	0.02	86.22
3-stars	12,795	5.42	6.73	0.01	69.67
4-stars	8,974	4.12	4.75	0.01	47.38
5-stars	2,885	2.10	2.64	0.01	30.88
Total	29,816	4.90	6.42	0.01	86.22

Source: Compiled by the authors based on data from Booking.com

Table V	Descriptive statistics of RpR by hotel size				
Size	N	Mean	SD	Minimum	Maximum
1-20	6,976	8.96	9.40	0.13	86.22
21-80	15,017	5.34	6.20	0.03	51.83
>80	11,902	2.50	3.16	0.01	32.46
Total	33,895	5.09	6.65	0.01	86.22

Source: Compiled by the authors based on data from Booking.com

Table VI	Descriptive statistics of RpR by hotel size and by regions				
Size by region	N	Mean	SD	Minimum	Maximum
AME					
1-20	1,510	6.54	7.04	0.13	78.46
21-80	2,564	3.63	4.09	0.04	37.95
>80	2,927	1.96	2.34	0.01	23.79
Total	7,001	3.56	4.70	0.01	78.46
ASP					
1-20	1,523	5.28	6.93	0.13	69.67
21-80	4,157	2.79	3.88	0.03	47.14
>80	4,156	1.30	1.84	0.01	23.52
Total	9,836	2.55	4.13	0.01	69.67
EUR					
1-20	3,709	11.65	10.39	0.15	86.22
21-80	7,775	7.42	7.12	0.04	51.83
>80	4,113	4.15	4.04	0.01	32.46
Total	15,597	7.56	7.89	0.01	86.22
MEA					
1-20	234	5.78	6.29	0.13	40.63
21-80	521	3.06	3.77	0.04	35.10
>80	706	2.16	2.32	0.01	16.12
Total	1,461	3.06	3.95	0.01	40.63

Source: Compiled by the authors based on data from Booking.com

Table VII	Descriptive statistics of RpR by independent and chain hotels and hotel size				
Type by size	N	Mean	SD	Minimum	Maximum
Independent					
1-20	6,853	8.95	9.40	0.13	86.22
21-80	13,330	5.32	6.31	0.03	51.83
>80	7,139	2.40	3.27	0.01	32.46
Total	27,322	5.47	7.06	0.01	86.22
Chain					
1-20	123	9.10	9.16	0.25	40.89
21-80	1,687	5.47	5.32	0.04	40.67
>80	4,763	2.64	2.99	0.01	26.79
Total	6,573	3.49	4.18	0.01	40.89

Source: Compiled by the authors based on data from Booking.com

4.4 Reviews per room by countries

By countries as we can see in Table VIII that the highest RpR mean is in European countries, the first non-European country is Costa Rica, in the 14th position. Table VIII only includes countries with more than 100 hotels in our sample (45), although the global sample includes 66 countries (Figure 1).

5. Conclusions

The results show that Booking.com has a dominant position in Europe, with relevant countries at the international tourist sphere, such as The Netherlands, Italy, UK, Spain and France with the highest RpR mean worldwide.

The expansion of Booking.com worldwide has been uneven in non-European countries, with the highest implementation of Booking.com in Costa Rica, Chile and Argentina (AME) followed by New Zealand and Australia (ASP). Other relevant markets but with a small share

| Table VIII	Descriptive statistics of RpR by countries				
Country	N	Mean	SD	Minimum	Maximum
The Netherlands	566	14.12	11.73	0.15	86.22
Italy	2,359	9.04	9.74	0.02	83.50
UK	1,152	8.84	7.93	0.09	47.15
Spain	1,130	8.72	8.08	0.02	59.78
France	1,929	8.35	6.61	0.11	51.92
Poland	441	7.51	6.42	0.24	51.83
Germany	1,480	7.37	6.88	0.05	59.00
Ireland	300	7.27	6.69	0.28	34.19
Portugal	490	6.74	6.98	0.06	47.94
Switzerland	484	6.58	6.23	0.06	33.71
Greece	537	6.57	7.03	0.01	38.90
Russia	1,486	6.03	7.50	0.02	64.00
Austria	822	5.58	7.12	0.04	52.29
Costa Rica	128	5.42	5.47	0.16	28.38
Turkey	1,520	5.35	6.47	0.02	54.60
Chile	277	5.21	6.27	0.06	56.10
Argentina	579	5.18	5.39	0.07	35.10
New Zealand	195	5.17	4.90	0.40	30.80
Romania	399	5.08	5.23	0.09	33.50
Denmark	285	4.82	5.42	0.05	37.71
Norway	217	4.61	4.90	0.32	26.48
Australia	437	4.54	4.33	0.15	26.69
UAE	311	4.30	2.72	0.44	16.12
Canada	500	4.07	4.27	0.04	31.92
Cambodia	368	3.98	5.36	0.02	35.00
Brazil	892	3.95	4.38	0.06	64.75
Colombia	820	3.94	4.80	0.05	47.83
Taiwan	831	3.94	5.92	0.04	63.08
Israel	320	3.78	5.84	0.01	40.63
Singapore	222	3.46	3.39	0.15	26.91
Thailand	1,478	3.26	4.74	0.02	69.67
Peru	480	3.21	5.12	0.02	58.95
South Africa	348	3.13	3.74	0.08	18.72
Mexico	650	3.03	4.55	0.02	43.88
Morocco	154	2.81	3.38	0.05	25.00
Vietnam	1,327	2.72	4.33	0.01	29.72
USA	2,180	2.56	4.09	0.01	78.46
Malaysia	653	2.46	3.58	0.06	40.70
Japan	762	2.15	3.86	0.02	38.45
Nepal	104	1.94	2.59	0.05	12.22
Indonesia	748	1.93	3.14	0.03	35.65
India	958	1.58	2.84	0.02	27.78
South Korea	241	1.40	1.85	0.04	14.39
Egypt	166	1.38	2.14	0.04	21.52
China	1,486	0.88	2.06	0.01	35.76

Source: Compiled by the authors based on data from Booking.com

are the USA, Mexico, Brazil, China, India or Vietnam, among others. The great presence of Expedia brands in AME, Priceline in the USA (Blomberg-Nygard and Anderson, 2016) and websites like Agoda and Ctrip which both have a high presence of hotels in ASP, especially in China (Zhou *et al.*, 2014) or HotelTravel in India (Blomberg-Nygard and Anderson, 2016) can explain these differences.

The low levels of RpR in most of the countries outside Europe should not be considered as a failure of Booking.com's expansion strategy. Booking.com has achieved a market share of 62 per cent among OTAs with an RpR of around 8 in most European countries (Schegg, 2016). Therefore, levels of 4 in the RpR of Australia, Canada or Brazil could equal market

Figure 1 RpR by country

Source: Compiled by the authors based on data from Booking.com through www.mapchart.net
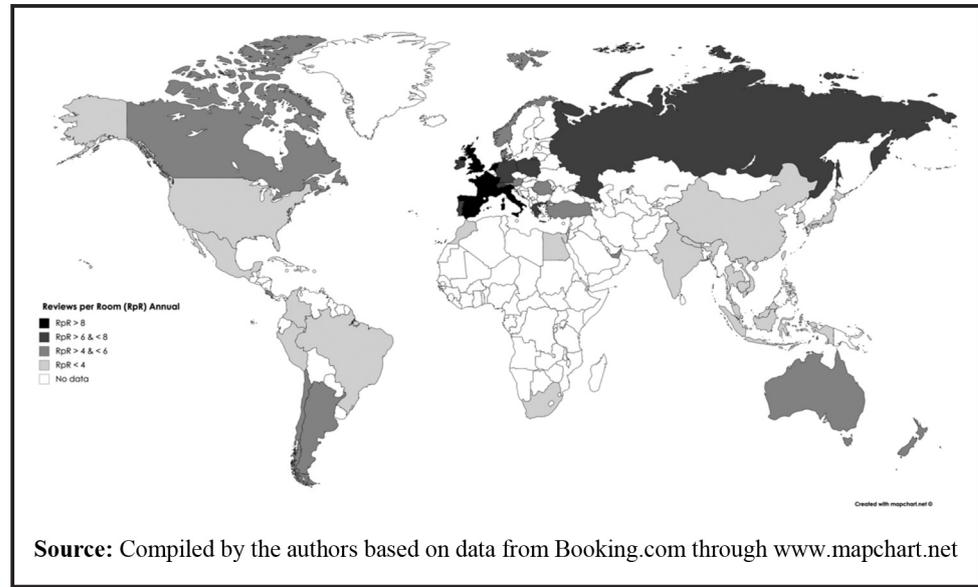
shares of around 30 per cent in those markets. In others such as Thailand, México or the USA where the RPR is close to 3, Booking.com could have market shares of 20-25 per cent.

The results show how there are factors that clearly influence the usage level of Booking.com, not only in Europe, where the company is strongly positioned for more than 10 years but also in geographical areas where the implementation of Booking.com is relatively recent. The three identified factors deserve a deeper discussion:

1. *Independent hotels* vs *chain hotels*: It is logical to expect that hotels belonging to hotel chains (especially in the case of medium and large hotel chains) have the capacity to make important investments to promote direct sales, either through the hotel's website, customer loyalty programs or other alternative channels. Numerous studies in the academic literature identified by Ben Aissa and Goaied (2016) highlight that those hotels belonging to hotel chains are much more profitable than the independent ones. Probably, the profitability improvement comes from avoiding paying commissions to agencies like Booking.com. Moreover, small hotels usually do not have a large reservation engine and use the Booking.com engine (Balagué *et al.*, 2016) pasting the code link into their websites (Booking, 2017b) so customers book through this OTA or through their websites but with the OTA engine which counts also as a reservation done through Booking.com.

2. *Small hotels* vs *Large hotels*: A small hotel usually implies limited financial resources and great difficulty to have a large and experienced sales and marketing team. In these circumstances, the easiest and most practical strategy is to use intermediaries such as Booking.com to channel hotel sales, assuming minimum commissions to be paid in this website or even paying additional commissions to appear in the top of rankings. It could be related to the findings of Ben Aissa and Goaied (2016) that also confirm that large hotels get high occupancy and better sales revenues.

3. *Low category* vs *High category*: The results confirm that hotels with highest categories sell fewer rooms through Booking.com. Otherwise, hotels with the lowest categories have bigger dependency on Booking.com because they have a higher RpR. This relation can be explained by the limitations in financial and staff resources commented previously for the case of small and large hotels. However, there is no mean difference

for 1-star and 2-stars hotels, which could be because of the fact that the features of those hotels are very similar (Martin-Fuentes *et al.*, 2018).

The concerns about possible bias because of reviewers could be much more likely to post reviews if they are extremely satisfied or disappointed, have been minimized after analyzing a previous 662,991 reviews database and searching for a relationship between scores and RpR, which we did not detect. Even if extremely disappointed customers tend to leave more reviews, there is such a small percentage of very negative reviews that the global effect would not be significant. In the case of extremely satisfied customers, if there was a significant bias, then we would have detected that hotels with better scores tend to have a higher RpR, which has not happened either.

Differences observed show that dependency on Booking.com varies within the same tourist destination. This study draws a situation in which hotels with a smaller structure are forced (or opt voluntarily) to use Booking.com with a greater intensity. What hotels should consider is whether it really is worth making that economic effort to increase direct sales or if it is preferable to continue paying commissions close to 20 per cent to intermediaries such as Booking.com. Nonetheless, an increase in the percentage of direct sales does not depend exclusively on the economic investment made to enhance this channel. Many times the use of appropriate strategies can improve these percentages without involving direct economic investments.

6. Limitations and future research

This study presents several limitations, as we worked on estimates and also focus on a specific profile of hotels in big destinations. Moreover, we used the number of reviews as a proxy to measure actual hotel sales and assumed homogeneous occupancy levels and average stay. Although this can be considered as a valid approach, it may cause an information distortion, particularly when we do not have information about response rates, occupancy levels or average stay length.

Intercultural differences between countries could imply differences in Booking.com surveys' response rates, which could explain partially the differences in RpR by country. However, the variations detected in the RpR according to size, hotel chain and stars are almost identical in all the defined geographical areas and in practically all of the countries analyzed. Therefore, the robustness and uniformity of these data makes us think that these factors are really significant in the level of use of Booking.com by hotels.

This study is only a first approximation as to how the RpR can be used to determine the level of sales that an OTA has in a single hotel or in a group of hotels. It would be advisable to carry out a parallel study, obtaining the RpR of the most important OTAs in each geographical area to obtain a more complete view of the market share by each OTA. It could apply to other OTAs that have a similar review system, like Expedia, Agoda or HRS. Moreover, the RpR figures can be tracked over time to determine changes in the hotel sales mix. Going further, automating and monitoring the entire data extraction process, public authorities or private entities could know in real time the weightage of each OTA in the sales of hotels around the world.

It would also be very interesting to carry out an in-depth study on the response rate of the Booking.com surveys, which would allow us to know more accurately the relationship between the number of reviews and sales. This can be developed through surveys that ask about the number of reservations made with Booking.com, total reservations, occupancy and length of stay. However, it is very difficult to obtain this information from hotels, which are usually reluctant to share this information.

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