

What Kind of Online Rating is Most Significant for Hoteliers? Case of Central Poland

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Abstract

The aim of this enquiry is to assess significance of impact of different sources of online reviews on hotel room rates. This is the very first research comparing various types of online reviews' sources as determinant of hotel prices. This research was conducted for all 193 star-ranked hotels operating in July 2017, in central Poland. However, analysis covered only those of establishments which were using all considered online reviews' sources (118 star-ranked hotels). To describe the impact of online reviews on hotel prices various models were estimated: for separate category of hotels (economy, midscale, and luxury) and for different date of check-in (working days versus weekends, and summer versus autumn) each.

Keywords: Hotel; Online ratings; Room rates; Central Poland.

1. Introduction

The goal of the paper is to assess significance of impact of different sources of online reviews on hotel prices. This is the very first research comparing various types of online reviews' sources: tripadvisor.com (representing user-generated content sites), trivago.com (example of travel meta-search websites), booking.com (representing online travel agencies), maps.google.com (example of general search engines developed for spatial and travel purposes), and facebook.com (investigated as most popular social media). When looking for possibilities to differentiate prices, hoteliers should be aware primarily of those online reviews which are justifying higher room rates. Thus, results of presented research has strong application context. Regarding confirmed hypotheses by Viglia, Minazzi, & Buhalis (2016), research on influence of both score and number of hotel online overall reviews was conducted.

2. Literature review

Nowacki (2017) argued that recently the Internet allows tourism enterprises, markets and destinations to develop themselves based on user-generated content. Thus, the role of online reviews becomes more and more significant. Using online reviews allow hotel guests to evaluate hotel services and to face with the problem of experience uncertainty and imperfect information about hotel services (Pekgün, Galbreth, & Ghosh, 2017). Youngsoo & Ramayya (2015) diagnosed that the estimation of the product value recently consists of assessment of objective quality and assessment of experience-based quality. Increasing significance of hotel online reviews and generally customer-generated content is the result of broader process of the internetization of hotel rooms distribution (Napierala, 2017).

Two factors influencing online review of hotel services should be emphasized: profile of hotel guest, and image of a destination in which a hotel is located (Banerjee & Chua, 2016). Aksoy & Yetkin Ozbuk (2017) discussed tourists' online evaluation of hotels' location. They investigated online reviews available at booking.com website for hotels operating in Istanbul, Turkey. The authors found that convenience of hotel location is one of the most important of consumers' hotel selection. What is more important, customers' online reviews were identified as strongly and positively correlated with experts' opinions about location of investigated hotels. Regarding increasing customers' ecological consciousness, Kim, Li, Han, & Kim (2017) used hierarchical regression to investigate impact of hotel green practices (e.g. energy saving, waste and water management, employee environmental training) on guests' overall ratings, revisit intentions, and hotel performance.

Searching for travel information by individuals means using websites of different categories, e.g. online travel agencies, individual travel companies, name your own price sites, social coupon, specific travel destinations, special interest sites, user generated content sites, general search engines, newspaper or magazine sites, and travel meta-search websites (Jordan, Norman, & Vogt, 2013). Discussing online hotel reviews, Lee, Hu, & Lu (2018) emphasized the problem of information overload. Thus, the usefulness of data on online hotel reviews becomes crucial for accommodation facilities to face with. It was confirmed that online hotel reviews presented by well-recognized online travel community are more credible and useful for customer behaviors in the future than ratings published by unknown communities (Casaló, Flavián, Guinalú, & Ekinci, 2015). Thus, online opinions posted by most popular communities verifying if an author of the opinion purchased and consumed hotel service, seem to be most reliable and useful. Regarding Polish, European or even global context, community of booking.com should be indicated as the most reliable and useful source of online hotel reviews (Castro & Ferreira, 2018) as it is leading service of online accommodation booking (Martin-Fuentes, 2016; Pawlicz, 2016). Lee et al. (2018) and Martin-Fuentes (2016) recommended using tripadvisor.com as a data source for research on hotel online reviews. They found mentioned website as largest and most user-friendly online travel community in the world.

Banerjee & Chua (2016) found that independent hotels were higher rated than comparable, but branded establishments. Moreover, reviews made by business travelers are generally more stringent than posted by other hotel

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guests. Thus, hotels targeting MICE tourism should face with the challenge of higher expectations of guests, and probably more stringent online rates. Geetha, Singha, & Sinha (2017) investigated accommodation facilities in Goa, India, and proved that the more luxury hotel is, the less significant impact on customer online reviews opinions posted by previous guests have. Stringam, Gerdes, & Vanleeuwen (2010) investigated online reviews posted on expedia.com and found that overall satisfaction rating is significantly correlated with any individual subcategory like hotel service, hotel condition, room cleanliness, or room comfort.

Yang, Mueller, & Croes (2016) confirmed that hotel online overall ratings are one of most significant variable determining volatility of room rates. It is argued that analysis of online hotel reviews as a determinant of room rates allows to justify price differentiation (Kościółek, 2017). Castro & Ferreira (2018) estimated different hedonic price models for differently star-rated hotels in Lisbon, Portugal. It is worth to be mentioned that influence of investigated online reviews for 4 and 5 star hotels were similar, while completely different for 3 star hotels. Kościółek (2017) used data from booking.com and investigated impact of guest ratings for hotels located in Kraków, Poland. He found that volatility of hotel prices is explained mainly by online rates of comfort and location posted in high season. However, impact of other independent variables like cleanliness, features, staff, and wi-fi access, was also discussed. On the other hand, Zhang, Ye, & Law (2011) analyzed data from tripadvisor.com for New York, USA and confirmed that for economy hotels, score of room quality is the most impactful determinant of hotel prices, room quality and location for midscale hotels, and location and service quality for luxury hotels. When studying correlation between hotel room rates and online reviews it must be emphasized that the better opinions about hotel posted are, the higher prices of the hotel accommodation services justified are. Same positive correlation is noticed for hotel online reviews and number of stars (Martin-Fuentes, 2016). When hotel guests are searching for best available offer, the higher room rate is, the higher expectations and requirements hotel guests reveal (Rhee & Yang, 2015). Viglia et al. (2016) confirmed positive influence of online ratings on hotel occupancy rate. Moreover, they found that hotel occupancy rate is also affected by the number of online ratings, regardless of the average score of hotel online reviews.

3. Methods

This enquiry was conducted for all 193 star-ranked hotels operating in July 2017, in central Poland. All mentioned establishments were listed in the Central Index of Hotel Establishments provided by the Ministry of Sport and Tourism of the Republic of Poland. The data was validated by the Regional Tourism Organization of Lodz Region. Regarding NUTS nomenclature, accommodation facilities operating in the following subregions were included: the city of Lodz, and subregions czestochowski, lodzki, piotrkowski, plocki, radomski, sieradzki, skierniewicki, and zyrardowski. However, analysis covered only those of establishments which were using all considered online reviews' sources. Thus, the subject of the study is constituted by 118 star-ranked hotels. Location of identified establishments and hotels included in the enquiry is presented on a map (see Figure 1).

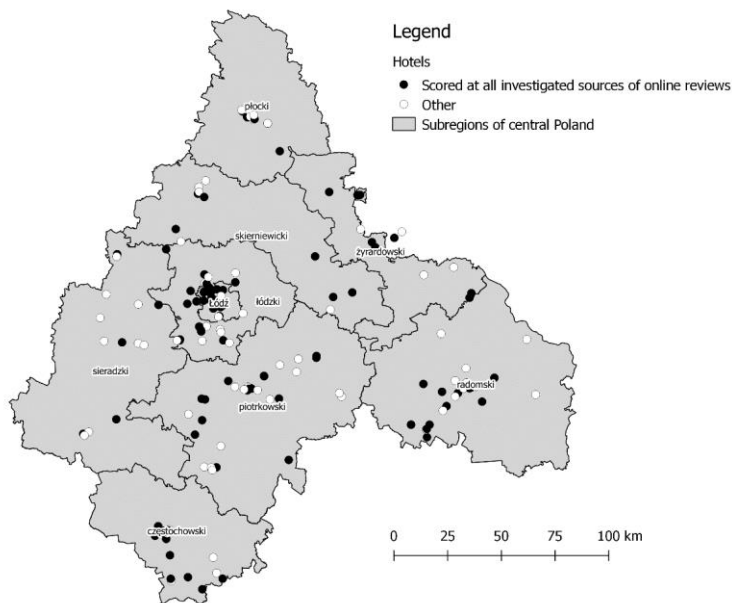


Figure 1: Location of the hotels operating in July 2017, in central Poland.
Source: author's own elaboration.

Both ordinary least squares regression and quantile regression were employed to estimate the impact of different sources of online reviews on hotel prices. Estimating the logarithmic equations allowed to solve the problem of heteroscedasticity (Agmapisam, 2014). Quantile regression models were estimated to identify impact of various

sources of online reviews on different points (low, medium, and high) in the distribution of hotel room rates (Zietz, Zietz, & Sirmans, 2008). Logarithmic hedonic price equation receives the following form:

$$\ln PRICE = \beta_0 + \beta_1 \cdot \ln TRIPAD_SC + \beta_2 \cdot \ln TRIPAD_MU + \beta_3 \cdot \ln TRIVAG_SC + \beta_4 \cdot \ln TRIVAG_MU + \beta_5 \cdot \ln BOOKIN_SC + \beta_6 \cdot \ln BOOKIN_MU + \beta_7 \cdot \ln GOOGLE_SC + \beta_8 \cdot \ln GOOGLE_MU + \beta_9 \cdot \ln FACEBO_SC + \beta_{10} \cdot \ln FACEBO_MU$$

Best available rates of double room with VAT tax, but without breakfast were considered. Separate models were estimated for economy, midscale, and luxury hotels. Moreover, for every hotels' category few dependent variables were investigated—room rates for particular dates of check-in: working day in Summer, weekend in Summer, working day in Autumn, and weekend in Autumn. Independent variables were based on various types of online reviews' sources: tripadvisor.com, trivago.com, booking.com, maps.google.com, and facebook.com. For every source of online reviews impact of score, and cross combined (score and number of reviews) was considered. In a Table 1, detailed list of investigated dependent and independent variables is presented.

Table 1: Specification and descriptive statistics of the dependent and independent variables included in the research.

Notation	Average	Minimum	Maximum	Standard deviation	Name of the variable
<i>PRICE_2308</i>	231.54	110.00	490.00	78.84	Room rates in PLN for check-in on August 23, working day in Summer
<i>PRICE_2608</i>	222.37	120.00	490.00	71.7	Room rates in PLN for check-in on August 26, weekend in Summer
<i>PRICE_2510</i>	239.85	110.00	550.00	87.11	Room rates in PLN for check-in on October 25, working day in Autumn
<i>PRICE_2810</i>	224.46	110.00	470.00	72.72	Room rates in PLN for check-in on October 28, weekend in Autumn
<i>TRIPAD_SC</i>	3.86	2.50	5.00	0.46	Score of hotel online reviews posted on tripadvisor.com
<i>TRIPAD_MU</i>	-	-	-	-	Score of hotel online reviews posted on tripadvisor.com multiplied by number of reviews
<i>TRIVAG_SC</i>	80.92	72.00	91.00	3.98	Score of hotel online reviews posted on trivago.com
<i>TRIVAG_MU</i>	-	-	-	-	Score of hotel online reviews posted on trivago.com multiplied by number of reviews
<i>BOOKIN_SC</i>	8.34	6.70	9.30	0.55	Score of hotel online reviews posted on booking.com
<i>BOOKIN_MU</i>	-	-	-	-	Score of hotel online reviews posted on tripadvisor.com multiplied by number of reviews
<i>GOOGLE_SC</i>	4.12	3.10	4.70	0.37	Score of hotel online reviews posted on maps.google.com
<i>GOOGLE_MU</i>	-	-	-	-	Score of hotel online reviews posted on maps.google.com multiplied by number of reviews
<i>FACEBO_SC</i>	4.39	1.00	5.00	0.46	Score of hotel online reviews posted on facebook.com
<i>FACEBO_MU</i>	-	-	-	-	Score of hotel online reviews posted on facebook.com multiplied by number of reviews

Source: author's own elaboration.

4. Results

Estimated models best explained empirical price volatility on working day in autumn (see Table 2). This confirmed results from previous studies for Polish hotel industry (Napierała, 2013; Pawlicz & Napierała, 2017). Thus, detailed analysis was provided only for this particular, mentioned date of check-in (October 25, 2017, working day in autumn).

Table 2: Coefficients of determination (R^2) for models describing impact of logged hotel online reviews on logged room rates estimated for economy, midscale and luxury hotels, and for various dates of check-in, in central Poland.

Category of hotels	Dates of check-in			
	Working day in summer	Weekend in summer	Working day in autumn	Weekend in autumn
Economy	0.3249	0.3356	0.5303	0.4463
Midscale	0.3899	0.3482	0.4137	0.4200
Luxury	0.5533	0.4801	0.7410	0.6014

Source: authors' own elaboration.

It needs to be underlined that regarding hotel class (economy, midscale or luxury), different sources of online reviews significantly influence room rates. For economy hotels only score of facebook.com reviews influenced hotel prices (see Table 3). Thus, when making price decisions, managers of economy hotels should first consider overall rating of facebook.com. However, this impact is negative, especially for the hotels offering lowest prices. Hence, when operating as an economy hotel, and employing low-price strategy, room rate occurs as a significant tool for achieving competitive advantage. The lower price hotelier charged its guests, the better score the enterprise might get.

Table 3: Regression coefficients for logarithmic models describing impact of hotel online reviews on room rates (on working day in autumn) of economy hotels in central Poland.

Independent variables	Coefficients estimated by			
	Ordinary Least Squares method	Quantile regression		
		For 25 th percentile	For 50 th percentile	For 75 th percentile
Intercept	3.07791	9.29228	-0.04449	-3.85680
ln <i>TRIPAD_SC</i>	0.11897	0.19396	-0.13211	0.09050
ln <i>TRIPAD_MU</i>	0.03912	0.06459	0.02852	0.04050
ln <i>TRIVAG_SC</i>	0.26485	-1.28285	0.86846	2.56042
ln <i>TRIVAG_MU</i>	-0.02673	-0.01463	-0.00591	-0.07559
ln <i>BOOKIN_SC</i>	1.09618	0.72575	0.71547	-0.50081
ln <i>BOOKIN_MU</i>	-0.02965	-0.02562	-0.00421	-0.00248
ln <i>GOOGLE_SC</i>	-0.23170	0.49743	0.25997	-0.56155
ln <i>GOOGLE_MU</i>	0.01280	-0.03263	0.03387	0.04141
ln <i>FACEBO_SC</i>	* -0.76121	-0.78315	-0.46553	-0.11533
ln <i>FACEBO_MU</i>	0.02761	0.06381	0.03793	0.02231

Source: authors' own elaboration.
Significance of variables: 0 *** 0.001 ** 0.01 * 0.05 . 0.1.

For midscale hotel prices are influenced in more complex manner by various sources of hotel online reviews. Impact of tripadvisor.com, booking.com and maps.google.com should be emphasized (see Table 4). What is interesting, the more negative opinion of guests about hotel services is, the higher number of reviews posted on maps.google.com is. Thus, impact on hotel prices of cross combined score and number of hotel reviews posted on maps.google.com is negative. Managers of midscale hotels offering lowest prices should also focus on online reviews published on booking.com. These establishments operate similarly to economy hotels. Number and score of positive opinions is affected significantly by low room rates. On the contrary, most expensive prices of hotels well assessed on tripadvisor.com might be easily justified for the clients.

Table 4: Regression coefficients for logarithmic models describing impact of hotel online reviews on room rates (on working day in autumn) of midscale hotels in central Poland.

Independent variables	Coefficients estimated by			
	Ordinary Least Squares method	Quantile regression		
		For 25 th percentile	For 50 th percentile	For 75 th percentile
Intercept	1.680272	-1.00993	-1.96146	1.66102
ln <i>TRIPAD_SC</i>	-0.201926	-0.13798	-0.17116	0.29595
ln <i>TRIPAD_MU</i>	*** 0.187325	0.19154	0.18258	0.21286
ln <i>TRIVAG_SC</i>	1.316452	2.17682	2.46799	1.23577
ln <i>TRIVAG_MU</i>	-0.003722	0.02700	-0.02675	-0.09520
ln <i>BOOKIN_SC</i>	-0.984551	-1.56256	-1.62537	-0.46849
ln <i>BOOKIN_MU</i>	. -0.083786	-0.13773	-0.05803	-0.03684
ln <i>GOOGLE_SC</i>	. 0.769166	0.83111	0.53797	-0.02489
ln <i>GOOGLE_MU</i>	** -0.150583	-0.12262	-0.09274	-0.12252
ln <i>FACEBO_SC</i>	-0.102414	-0.21854	-0.04409	0.03781
ln <i>FACEBO_MU</i>	-0.001639	-0.00416	-0.02675	-0.02226

Source: authors' own elaboration.
Significance of variables: 0 *** 0.001 ** 0.01 * 0.05 . 0.1.

Searching for offers of luxury hotels is mainly based on score of hotel guest reviews published on maps.google.com (see Table 5). The higher rating characterizes hotels on maps.google.com, the higher rates of hotel rooms justified are. However, this impact is significant rather for cheaper than more expensive luxury hotels.

Table 5: Regression coefficients for logarithmic models describing impact of hotel online reviews on room rates (on working day in autumn) of luxury hotels in central Poland.

Independent variables	Coefficients estimated by			
	Ordinary Least Squares method	Quantile regression		
		For 25 th percentile	For 50 th percentile	For 75 th percentile
Intercept	-2.69885	-1.02562	-4.91432	4.21163
ln TRIPAD_SC	-0.69150	0.21240	-0.71690	0.22531
ln TRIPAD_MU	0.05176	-0.15583	0.12226	0.07929
ln TRIVAG_SC	1.66791	1.05839	2.53590	-0.69928
ln TRIVAG_MU	0.09630	0.16506	0.03157	0.14138
ln BOOKIN_SC	-0.38715	-1.60976	0.17964	0.92150
ln BOOKIN_MU	-0.10710	-0.01566	-0.13512	-0.11693
ln GOOGLE_SC	2.71837	4.91820	1.80286	2.53504
ln GOOGLE_MU	0.10121	0.08318	0.08842	0.04940
ln FACEBO_SC	-1.18533	-2.38598	-1.65943	-1.73088
ln FACEBO_MU	-0.03003	0.08929	-0.06024	0.02801

Source: authors' own elaboration.

Significance of variables: 0 *** 0.001 ** 0.01 * 0.05 . 0.1.

5. Conclusions

Influence of particular sources of hotel online reviews on room rates depends on class of the hotel. Thus, justification of any price decision, both increasing and decreasing room rate, should be followed by detailed analysis of different online reviews (both overall score and volume).

When considering economy hotels, scores posted on most popular social media (facebook.com) are the only significant determinant of hotel prices. For hotels of the middle class, revenue managers should focus on various sources of online reviews: user-generated content sites (tripadvisor.com), websites of online travel agencies (booking.com), and spatial search engines (maps.google.com). And finally in the case of luxury hotels, higher online ratings posted on maps.google.com might significantly justify increase of hotel prices. Moreover, for economy hotels and cheapest midscale enterprises, decreasing room rates allow to improve the overall guest reviews. On the other hand, for premium midscale hotels and luxury accommodation facilities, higher prices might be justified by higher quality of the service, and parallelly higher online scores.

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