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Online review ratings: an analysis of product attributes and competitive environment

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ABSTRACT

Online reviews generated by consumers have reached a huge diffusion among buyers and constitute an important marketing communications tool for companies that allow them to successfully promote a product. This study adopts a less developed approach in previous studies and tries to analyse what attributes of a product or service are relevant when it comes to getting a good online assessment of consumers as well as to analyse if the competitive environment of the company also affects the ratings. Based on a sample of 1,870 Spanish hotels and using regression analysis, our results show that vertical and horizontal differentiation, age, and price are characteristics of a product that positively impact the online rating given by consumers. However, pricing of additional features can reduce the effect of horizontal differentiation on online rating due to the different value to consumers of those features. Additionally, the competitive environment also has an impact on the online rating and paradoxically, areas with a higher concentration of competitors allow companies to obtain a better evaluation if the competitors are not co-located very close to the company. These findings can support company marketers to manage consumer online reviews and help marketers in promoting a product.

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Online product review (OPR); differentiation; price; age; competition; agglomeration

Introduction

Online product rating (OPR) carried out by consumers are considered as a prominent way in which product word-of mouth (PWOM) occurs (Chen, Luo, and Wang 2017), currently plays an essential role in the consumer journey (Hong and Pittman 2020; Park, Lee, and Han 2007). Communication literatures assume that online review content in the form of customer feedback enhances the credibility of a product to the prospective customers (Daugherty and Hoffman 2014). Consequently, it has become in a critical advertising and communication component to promote the success of a product (Kozinets et al. 2010), being a valuable information for consumer decision-making in online environments (Mudambi and Schuff 2010). Therefore, a substantial body of marketing research has analyzed the effect of OPRs on cumulative economic outcomes (Floyd et al. 2014), but

essentially two metrics have prevailed volume and rating and with a disagreement about which metric is the main predictor of economic outcomes (Rosario et al. 2016; You, Vadakkepatt, and Joshi 2015).

Due to the current relevance of OPRs for the firm performance, there are numerous articles focused on the OPRs generation and what features influence the rating of an online consumer (Liu, Steenkamp, and Zhang 2018; Ketelaar et al. 2015; Kim, Jun, and Kim 2018; Mathwick and Mosteller 2017). Despite this, to the best of our knowledge, there are two research gaps in the previous literature. Firstly, most of the works adopt a consumer perspective while studies focused on product characteristics are scarcer (Martin-Fuentes 2016; Li and Hitt 2010). Additional arguments justify an analysis of how attributes can impact the rating. Through product differentiation, companies can increase sales through OPRs (Clemons, Gao, and Hitt 2006), quality may impact on the OPRs due to the expectations associated with a product may be different depending on quality differentiation (Manes and Tchetchik 2018) and pricing strategy can steer and control the consumer-generated information flow (Yu, Debo, and Kapuscinski 2016). With respect to organizations, older companies have achieved a better reputation over the years (Sahadev and Islam 2005) and OPRs can promote this reputation whereas if the size of the company is disproportionate, the services offered can deteriorate due to the congestion (Radojevic, Stanic, and Stanic 2017).

And secondly, despite the evidence of the relationship between the competitive environment and online reputation (You, Vadakkepatt, and Joshi 2015), there are few studies that analyze this issue (Liu, Steenkamp, and Zhang 2018) and are focused on volume rather than rating, which can be counterproductive as low ratings with high volume can reduce the effectiveness of OPRs as a marketing communication tool (Hong and Pittman 2020).

Our study tries to fill these gaps by deepening into the impact of product attributes and competition environment on review rating. For it, we carry out an empirical analysis whose reference framework is the hotel industry. Based on a sample of 1,870 Spanish hotels, we analyze the determinants of OPRs rating with regression analysis. Several contributions to the marketing literature are provided with the present research. First, our work extends the previous studies about ORs to understand the characteristics that determine the rating of ORs. And second, this research expands results of previous studies about the impact of the competitive environment on ORs to understand how the offline environment may impacts on the online one (Liu, Steenkamp, and Zhang 2018).

Literature review

Product differentiation and online rating

Nowadays, through the Internet, consumers can compare and choose the product that best suits their needs (Clemons, Gao, and Hitt 2006), so this can encourage companies to develop horizontal differentiation strategies. However, there are few studies that have studied as horizontal differentiation can impact on the OPRs. Recently, Liu, Steenkamp, and Zhang (2018) found that the concentration of non-differentiated products can drive OPRs volume up to a certain threshold.

Concerning the relationship between rating and differentiation, the proliferation of online consumer reviews makes it easier for a consumer to find the product that best fits

their individual preferences. Indeed, online environment enables consumers to perform a targeted information gathering, avoiding misguided choices, and reducing the uncertainty of product-consumer fit and increase consumer's satisfaction (Hong and Pavlou 2014). Likewise, a greater degree of horizontal differentiation can foster a greater volume of online reviews (Lovett, Peres, and Shachar 2013), and increase product selling (Clemons, Gao, and Hitt 2006). These suggest a positive impact of differentiation on online reputation and therefore, we establish the following hypothesis:

H1: *The differentiation of a product or service has a positive impact on the online product rating given by consumers.*

Size and online rating

Within the context of the service industry, the size of the company (for example, the size of the hotel measured as the number of rooms available) can condition various aspects related to customer satisfaction and complaints received.

On the one hand, large companies have more resources and can take advantage of them to improve customer satisfaction (Venkataraman and Low 1994). On the other hand, larger companies are more rigid and less flexible in contrast to smaller companies, which can slow down their reaction when they face customer complaints (Perry-Smith and Blum 2000). Also, with hotel industry as a research frame, the previous literature shows that size of the company can also influence OPRs generated by consumers (Au, Buhalis, and Law 2014; Del Chiappa and Dall'Aglío 2012; Radojevic, Stanisic, and Stanic 2017). Au, Buhalis, and Law (2014) found that the size of the hotel impacts the volume of online complaints and both Au, Buhalis, and Law (2014) and Del Chiappa and Dall'Aglío (2012) concluded that the size of the hotel can condition the complaints that customers express through OPRs. Finally, Radojevic, Stanisic, and Stanic (2017) found that a disproportionate size of the company cause congestion in the services offered, causing them to deteriorate, which ultimately has a negative impact on the online valuation of customers. Consequently, the increase of the size of a company may increase the online rating up to a level from which it begins to decrease. Then, we propose the following hypothesis:

H2: *There is a curvilinear, concave down relationship between the size of the company and the online product rating.*

Company age and online rating

Previous studies suggest that the age of the company that offers a product or service may have an influence on the online rating of customers (Chanwisitkul, Shahgholian, and Mehandjiev 2018; Kim, Kim, and Heo 2016; Sahadev and Islam 2005; Xu and Li 2016)

On the one hand, old facilities may be the source of dissatisfaction among consumers of a product or service (Xu and Li 2016) and this dissatisfaction can be reflected in negative ORs (Kim, Kim, and Heo 2016) that in turn cause a decrease in the online rating (Chanwisitkul, Shahgholian, and Mehandjiev 2018). Given that, more experienced

companies may not adequately upgrade their facilities due to the status achieved over the years (Sahadev and Islam 2005; Hung, Shang, and Wang 2010), suggesting that the company age can negatively influence online rating.

On the other hand, it has also been found that the experience of a company allows it to increase its sales (Hung, Shang, and Wang 2010) due to the reputation achieved over the years (Sahadev and Islam 2005) and OPRs can promote this reputation. Based on these arguments, we consider the following hypothesis:

H3: *The age of the company offering a product has a positive impact on the online product rating given by consumers.*

Product quality and online rating

Several marketing studies have identified quality as a key variable of customer selection process (Zeithaml 1988). This effect of quality on customer behaviour also can affect consumer behaviour in online environments due to OPRs reflecting the value perceived by the consumer, considering the perceived value as the difference between product quality and purchase price (Li and Hitt 2010). Consequently, the expectations associated with a product may be different depending on quality differentiation (Manes and Tchetchik 2018) and quality may impact on the OPRs. Thus, Lovett, Peres, and Shachar (2013) show a positive relation between volume of eWoM and quality, so consumers generate higher volume of eWoM for higher quality brands. Neirotti, Raguseo, and Paolucci (2016) found that quality moderates the OPRs impact on sales and concluded that the relationship between online visibility and sales is stronger for higher quality firms. Liu, Steenkamp, and Zhang (2018) found that quality moderates the effect of agglomeration on the volume of OPRs.

Despite this, there is a lack of research on the impact of quality on the rating of OPRs (De Langhe, Fernbach, and Lichtenstein 2016) and only a few previous studies have considered it (Bulchand-Gidumal, Melián-González, and López-Valcárcel 2011; Martín-Fuentes 2016; Radojevic, Stanisic, and Stanic 2017). This issue has particular interest since through its analysis it can be ascertained if OPRs are an adequate index of objective quality. Thus, based on the revised S-O-R model (Jacoby 2002), considering that it is psychological reality, not objective reality, what determines our behavior, we can assume that consumers prioritize public and validated sources of reliable information (Engler, Winter, and Schulz 2015). Therefore, we propose that the higher the tested quality of a product, the higher the rating it will receive. The following hypothesis is proposed:

H4: *The tested quality of a product has a positive impact on online product evaluation.*

Price and online rating

Under the perspective that price can be considered as a pre-purchase quality signal when buyers are uncertain about a new purchase (Kirmani and Rao 2000), previous research has analyzed the impact of price in the buyer post-purchase satisfaction stage (Li and Hitt

2010), due to the mismatch between customer expectations and the actual quality of products/services after consumption (Rust et al. 1999). Under this approach, consumers can consider the price of products/services when they post OPRs with a negative effect on the rating (Li and Hitt 2010). Furthermore, consumers can share through positive OPRs the low prices they pay (You, Vadakkepatt, and Joshi 2015).

On the other hand, a low price can raise doubts about quality of product (Raab et al. 2009) and it can negatively impact on the overall satisfaction (Cao, Gruca, and Klemz 2003). Moreover, ORs can increase the consumer's willingness to pay (Kostyra et al. 2016) by decreasing customer's price sensitivity so premium-price products experiment a stronger impact of online rating on purchases (Maslowska, Malthouse, and Viswanathan 2017), and premium-price products obtain higher online ratings (Martín-Fuentes 2016). Due to these quality-signals based arguments, we suggest the following hypothesis:

H5: *Product price has a positive impact on the online product rating given by consumers.*

In horizontally differentiated firms, pricing additional features can diminish profitability due to competitive effects that modify the perceived value (Shulman and Geng 2013). Specifically, when firms are engaged in non-price competition to differentiate themselves, free amenities can be regarded as add-on services that increase consumer value. However, when consumers receive additional services, they avoid pay extra fees (Liu et al. 2020) and can angers consumers, under highly competitive conditions as it is the hospitality industry (Fruchter, Gerstner, and Dobson 2011). Then, as the number of features offered increase, the price-value perception diminishes, we posit the following hypothesis that account for the negative effect of pricing:

H6: *Product price mitigates the positive impact of product differentiation on online product rating.*

Competitive environment and online rating

Although in the previous literature there are evidence that show the impact of competitive environment on OPRs, both on their generation (Liu, Steenkamp, and Zhang 2018) and on their effect on economic results (Neirotti, Raguseo, and Paolucci 2016; You, Vadakkepatt, and Joshi 2015), there are few previous studies that have addressed this question (Gutt, Herrmann, and Rahman 2019; Liu, Steenkamp, and Zhang 2018). Thus, Liu, Steenkamp, and Zhang (2018) analyzed how a greater number of competitors can promote the generation of OPRs up to a threshold from which the volume of OPRs begins to decrease. Their study does not clarify whether this increase in volume translates into a better or worse rating, a relevant question since an increase in the volume of OPRs does not always produce beneficial effects because ratings can moderates the impact of volume on sales (Manes and Tchetchik 2018) and a higher volume can generate cognitive overload which it might result in negative effects on consumers' purchase (Maslowska, Malthouse, and Bernritter 2017; Park and Lee 2008).

Regarding that question, Gutt, Herrmann, and Rahman (2019) analyzes how more concentrated markets present a rating distribution with a lower average and greater variance, that is, concentration within the same market decreases the average online rating of the market but they do not analyze the impact on each company in the market. Their results suggest that when a company faces a greater number of competitors it may experience a decrease in the online rating of consumers, partly because greater competition can encourage negative fake reviews by competitors (Luca and Zervas 2016). This negative effect together with a higher volume (Liu, Steenkamp, and Zhang 2018) can be counterproductive for the credibility of OPRs and reduce their effectiveness as a marketing communication tool (Hong and Pittman 2020).

On the other hand, agglomeration theories postulate benefits for companies generated by a greater concentration of competitors (McCann and Folta 2008), due to the existence of exogenous externalities like transportation infrastructure that consumers can enjoy and endogenous externalities like heightened demand and reduced search costs, demand spillover, resource spillover (Lee and Jang 2015) and more qualified workforce with specialized skills (Almeida and Kogut 1999) who can provide better service to customers. In addition, the central place theory (King 1984) postulates a concentration of economic activities, so that an area of greater concentration can offer greater services to customers such as entertainment or dining options (Lee and Jang 2015). For all these reasons, the concentration of competitors can have a positive impact on the online evaluation of customers. Then, the following hypothesis is proposed:

H7: *The number of competitors has a positive impact on the online product rating given by consumers.*

Additionally, regarding the distance between competitors, there is a lack of studies that analyze their impact on the online rating, although Mayzlin, Dover, and Chevalier (2014) analyzed how a smaller distance to competitors also increases the probability of online fake reviews and therefore we establish the following hypothesis about the impact of distance on online consumer reviews:

H8: *Distance between competitors has a positive effect on the online product rating given by consumers.*

Methodology

Sample and variables

We carried out our study within the hotel context and we considered the hotel industry in Spain as a study framework through a sample of 1,870 hotels obtained with data from an international group travel agency (Veturis.com), together with web scraping techniques. Data was obtained for each hotel on the valuation of customers, category, price (for the year 2017), services offered, number of competitors and distance to them. The hotels in the sample are distributed in 66 cities and 484 commercial areas defined by the group travel agency.

The explanatory variables considered to model the customers' online rating in this study were:

- *Differentiation*. This variable measures the horizontal differentiation in the services offered by hotels located in the same commercial zone based on a distance measure proposed by Gimeno and Woo (1996). For a hotel i in the commercial area C_i , the measure is given by:

$$Differentiation_i = \sum_{\substack{j \in C_i \\ j \neq i}} \frac{S_i - S_j}{m}$$

where S_i is a vector with 71 dummy variables that indicate the services offered (see Table A1 with the differentiating features) by the hotel i and m represent the number of competitors located in the same commercial area. The greater the value of the variable, the greater the differentiation, so that when its value is zero the differentiation of the hotel is minimal.

- *Size*. This variable measures the hotel size through the total number of rooms in a hotel.
- *Age*. This variable represents the number of years of the property.
- *Quality*. Since the hotel industry has consistent quality levels through the hotel category (Manes and Tchetchik 2018), we have considered the incorporation of the quality through the official hotel category assigned by the agencies based on Spanish regional regulations (Silva 2015). We consider four dummy variables to represent from two stars to five stars and the category one star used as the reference.
- *Price*. Because the price in the hotel industry is subject to dynamic management and may change due to the seasonality and events developed in a destination, we have considered the average yearly price, since it is free of price variations caused by seasonality, distribution channels and events (Lee 2015).
- *Competitors*. This variable, for each hotel, measures the number of competitors located in the same commercial area. The commercial areas considered are the commercial areas defined by the group travel agency. This variable is not constant in the analyzed sample due to the variety of commercial areas included in the sample.
- *Distance*. The average distance in lometers to the rest of the competitors located in the same commercial area is represented by this variable.

Finally, the dependent variable represents the average evaluation of consumers on a scale from 0 to 10, where 0 is the worst possible evaluation while 10 is the best possible evaluation.

Model selection and estimation

To test all the hypotheses proposed previously, we have considered the following model:

$$\begin{aligned}
\text{Rating}_i = & \alpha_0 + \beta_1 \text{Differentiation}_i + \beta_2 \text{Size}_i + \beta_3 \text{Size}_i^2 + \beta_4 \text{Age}_i + \beta_5 \text{Age}_i^* + \beta_6 \text{Age}_i^{**} \\
& + \beta_7 \text{Age}_i^{***} + \beta_8 \text{Size}_i^* + \beta_9 \text{Price}_i + \beta_{10} \text{Differentiation}_i * \text{Price}_i \\
& + \beta_{11} \text{Competitors}_i + \beta_{12} \text{Distance}_i + \varepsilon_i
\end{aligned}$$

The estimation method used was OLS and the standard errors have estimated with the bootstrap methods. Through the Breusch-Pagan test we detected heteroscedasticity in the model (p-value 7.5E-5) and due to this the dependent variable was log-transformed to consider a semi-logarithmic model that can mitigate the heteroscedasticity (Kennedy 2008). After log-transformation, we applied the Breusch-Pagan test again, whose *p*-value (0.9365) clearly indicates that final model is also free of heteroscedasticity. Consequently, for a continuous variable, the coefficient multiplied by 100 provides the percentage impact on rating while, for a dummy variable, the percentage effect is computed by $100 \cdot (e^{\beta_i} - 1)$ (Halvorsen and Palmquist 1980). Table 1 shows a statistical summary of the sample considered in the study.

Next, since the model includes the interaction between differentiation and price, we have standardized both variables by subtracting their respective means to avoid multicollinearity problems. The existence of multicollinearity between predictors was verified using the generalized variance inflation factor (VIF). Table 2 provides the generalized VIF values and shows that the model is free of multicollinearity since all VIF values are below the critical values (Kennedy 2008).

Results

Table 3 shows the results obtained with the estimation of the final model using OLS and additionally also provides R^2 value.

Firstly, hypothesis H1 is confirmed since the main effect of differentiation in services impacts positively in the online ratings whereas H2 is not confirmed because both the impact of Size on online ratings and Size^2 are not significant.

Secondly, hypothesis H3 is confirmed since the number of years of experience has a significant effect on the online evaluation of users. This effect is positive, with an additional year of experience representing an increase of 0.1% in the value of the consumer OR, which indicates that customers associate a greater number of years of operations with better service which is reflected in their online assessments.

Table 1. Sample descriptive statistics.

Variable	Min	Q1	Median	Q3	Max	Mean	St. dev
Ln(Rating)	−1.609	1.946	2.028	2.079	2.303	2.008	0.144
Size	3	47	77	126	1500	102.4	99.695
Differentiation	0	1.144	1.768	2.281	5.174	1.795	0.723
Age	1865	2001	2004	2007	2017	2003	7.939
Price	24.96	49.84	62.18	81.01	1224.16	74.76	60.408
Competitors	1	6	19	48	323	56.85	92.565
Distance	0	0.870	1.550	2.630	20.950	2.071	2.143
Category	1*	2*	3*	4*	5*		
%	1.979	8.770	35.561	49.358	4.332		

Regarding the effect of quality differentiation in online evaluations, its evaluation requires a more in-depth analysis due to its representation through dummies. From Table 3 we can see the significance of each category with respect to the reference category (1*) so that all the higher categories present a significant increase in the online rating of consumers, except for category 2* which it does not present a significant effect with respect to 1*, which means that the online evaluations of consumers are similar for both categories. Additionally, for the rest of the categories we can see how if the corresponding estimated coefficient increases as we consider higher quality categories, which agrees with the statement set by hypothesis H4. For a more detailed analysis, we will also consider the effect difference on the online rating of each pair of hotel categories.

Table 4 shows the pair-wise comparison between the coefficients corresponding to each hotel category. Multiple comparisons show that all the associated coefficients are significantly different except for the 1* and 2* pair, as already deduced from the results shown in Table 3. Thus, we can see that there are significant differences in the online assessment between hotels of different categories (except between 1* and 2*) and as the quality category is higher, the greater the positive effect on the online rating of consumers. More specifically, the online valuation of a hotel increases by 3.58% if we change its category from 2* to 3*, keeping the rest of the variables in their values. Similarly, the increase in online rating is equal to 7.28% when the category changes from 3* to 4*. Finally, the difference in effect between the 4* and 5* categories represent an increase of 7.26% in favor of 5* hotels. Consequently, hypothesis H4 is confirmed, and higher quality translates into better online assessment of consumers. thus, quality is a determining factor to get positive reviews online.

Regarding price, it shows a significant main impact on online evaluations, thus confirming hypothesis H5. Next, the interaction between differentiation and price is significant and its coefficient is negative. Thus, the hypothesis H6 is confirmed and consequently the price mitigates the positive effect of differentiation on online rating. To analyze in more detail the moderation of price on the effect of differentiation, Figure 1 depicts the differentiation effect on online rating for three levels of price, the average price, and the average price \pm one standard deviation. From Figure 1, the effect of differentiation is reduced with the increase in price.

To clarify the moderating effect of price on the impact of differentiation on online rating vividly, we obtained the Johnson-Neyman interval (Bauer and Curran 2005) which tells us the range of values of the price in which the effect of differentiation is significant versus not significant with a 95% confidence level (Figure 2). From Figure 2, the effect of

Table 2. Generalized VIF for the explanatory variables.

Variable	Generalized VIF	Df
Differentiaton	1.0701	1
Size	3.7071	1
Size ²	3.4057	1
Age	1.0138	1
Category	1.2501	4
Price	1.1291	1
Differentiation×Price	1.0669	1
Competitors	1.2070	1
Distance	1.1838	1

Table 3. Final model estimation.

Variable	Coefficient	Standard error	p-value
Intercept	−0.2225	0.8224	0.7867
Differentiation	0.0097**	0.0045	0.0307
Size	−2.1E-5	5.9E-5	0.7215
Size ²	−1.9E-8	6.9E-8	0.785
Age	0.0011***	0.0004	0.0010
2*	0.0309	0.0248	0.2132
3*	0.0660***	0.0232	0.0045
4*	0.1363***	0.0232	5.2E-9
5*	0.2064***	0.0278	1.7E-13
Price	0.0001**	5.0E-5	0.0239
Differentiation×Price	−0.0001*	6.8E-5	0.0832
Competitors	0.0001***	3.8E-5	0.0083
Distance	0.0028*	0.0017	0.0974
R ²	0.1338		

***p < 0.01

**p < 0.05

*p < 0.1

Table 4. Difference effect pairwise comparison between hotel categories.

Categories	2*	3*	4*	5*
1*	0.0309	0.0660***	0.1363***	0.2064***
2*		0.0351***	0.1054***	0.1755***
3*			0.0702***	0.1403***
4*				0.0701***

***p < 0.01

**p < 0.05

*p < 0.1

differentiation is positively significant only when price is under 82.97 euros and when price is above 82.97, the effect of differentiation is not significant.

Concerning the analysis of the impact of competition on ORs, we will start with the impact of the number of competitors. Table 3 shows that the impact is positive and significant, one more additional competitor in the commercial area represents an increase in the online rating of 0.01%. In this way, hypothesis H7 is confirmed and given that the concentration of competitors has a positive effect, the relationship between number of competitors and online rating is supported. Finally, with respect to the hotel agglomeration, the impact of distance is also positive, which means that a greater distance between competitors has beneficial effects on the online rating, confirming hypothesis H8. A one kilometer increases in the distance to the competitors represents an increase of 0.28%.

These results involve that the ideal location would be in a commercial area with many competitors separated by a high distance among them. However, it is unlikely to find such a type of location, since an increase in the number of competitors will probably reduce the distance between them. Due to this contradictory effect, we can deduce that there is a trade-off between the number of competitors and the distance, i.e., it is necessary to evaluate whether it is more convenient to increase the distance by decreasing the

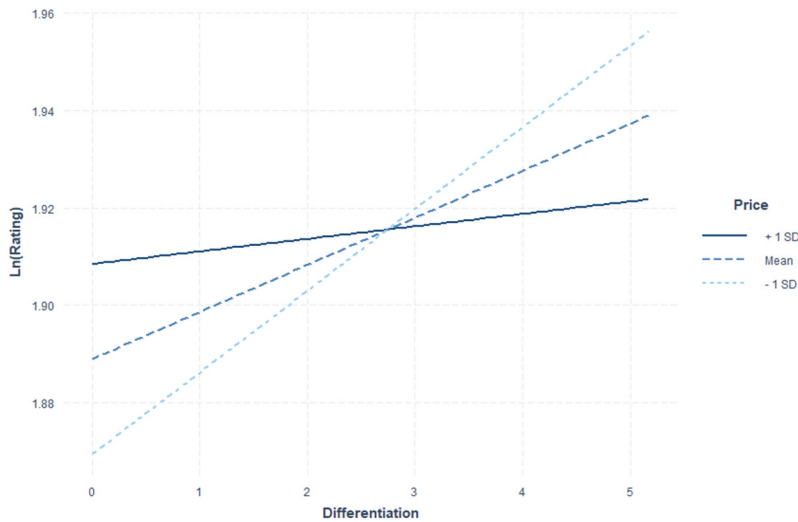


Figure 1. Moderating effect of price on the relationship between differentiation and online rating.

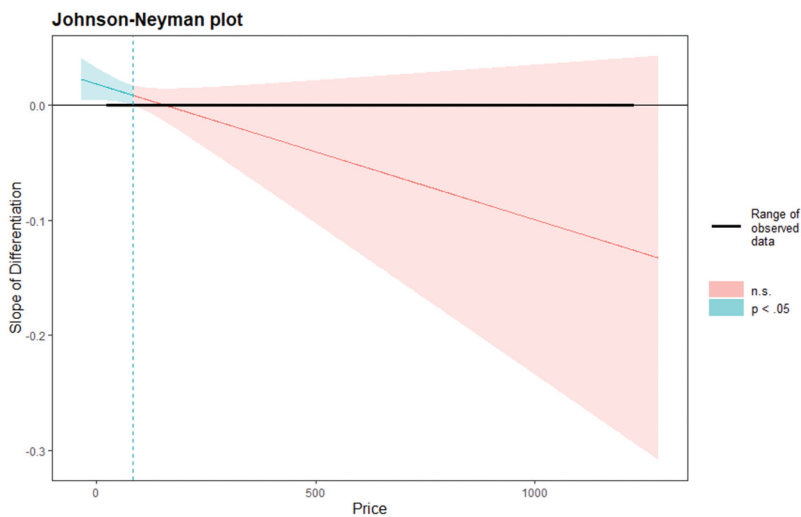


Figure 2. Johnson-Neyman plot for the moderation of price on differentiation.

number of competitors, or to increase the number of competitors thereby decreasing the distance.

To analyze this issue, [Figure 3](#) displays the relationships between the predicted online rating, the number of competitors and the average distance among them (other explanatory variables *ceteris paribus*). [Figure 3](#) shows that the online rating associated with the maximum distance observed in the sample (e.g., 20,950 kilometers) and minimum number of competitors in the sample (e.g., one competitor) is higher than the online rating achieved with the maximum number of competitors (323 competitors) and the minimum distance (0 kilometers). Also, it shows that, even in an isolated area without competitors,

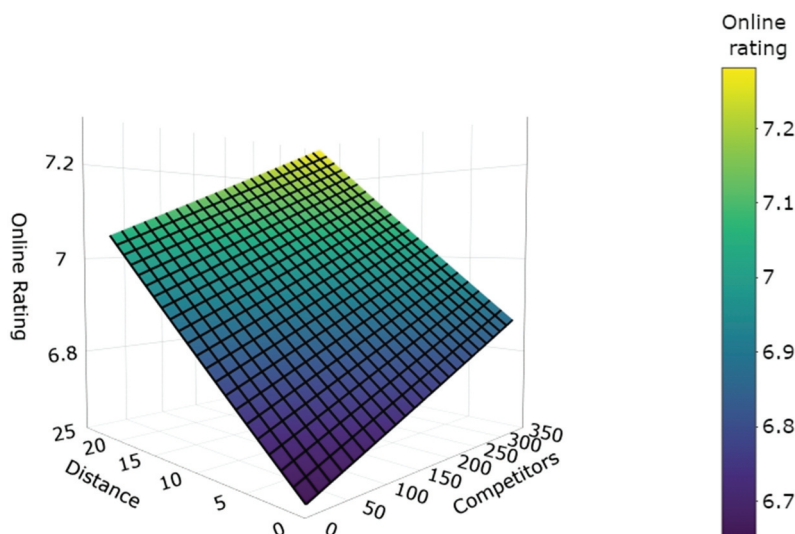


Figure 3. Estimated rating with the final model based on competitors and distance.

the average distance to the competitors allows to achieve a higher rating than in concentrated areas with less distance between competitors. Thus, from the coefficients in Table 3, the increase in the OR obtained by an additional kilometer in the distance to the competitors is equivalent to the increase produced by 28 additional competitors ($0.0001 \times 28 = 0.0028$). Equivalently, a new additional competitor yields an increase of the OR provided that the average distance is not reduced by more than 0.036 km.

Therefore, it is preferable to locate with fewer competitors but at a greater distance than in concentrated locations but with less distance between competitors.

Conclusions, limitations, and future research

Prior research has shown the relevance of product for OPR creation (Clemons, Gao, and Hitt 2006), and that competence at the aggregate market level produced a negative effect on rating (Gutt, Herrmann, and Rahman 2019). Also, from an expectation perspective, a negative effect between pricing and OPR was found (Li, X., and Hitt 2010). In this article, due its relevance for organization communication credibility and consumer behavior, we base on signaling, the S-O-R model and agglomeration theories to explain the effects of product differentiation, quality, pricing, and competition.

The key objective of this study is to examine the role of product pricing, differentiation and competition play in consumer online review. By means of a regression analysis over a database built on 1,870 hotels, the authors empirically provide evidence that vertical and horizontal differentiation, pricing, agglomeration of competitors and location exert a significant role on the online product review rating. To the authors' knowledge, this is the first study to examine simultaneously the relationship between both dimensions of competition (i.e., degree of concentration of competitors in an area and distance between competitors) and OPR. Additionally, and following the call by De Langhe, Fernbach, and Lichtenstein (2016), this is a contribution that can clarify the blurry relationship between

objective quality and review rating, supporting the quality signal role of pricing for online consumers in contrast with the utility perspective (Li and Hitt 2010).

Theoretical implications

Several implications can be established from this study. Firstly, from a theoretical perspective, our result showed that both vertical differentiation of a product (i.e., tested quality) and horizontal differentiation have a positive effect on consumer's online rating, revealing the role of differentiation features in reducing the uncertainty of product-consumer fit. Thus, the online rating can account for both objective and perceived product quality for most consumers, as posited by Engler, Winter, and Schulz (2015), extending De Langhe, Fernbach, and Lichtenstein's (2016) objective quality analysis. The size of the company has no significant impact on consumers' evaluation. Secondly, OPRs help to promote the reputation achieved by a company over the year since companies with more years of experience achieve a higher reputation online. Finally, our results reject the assumption of a negative relationship between price and OPR (Li and Hitt 2010), embracing the view of price as a quality cue (Martin-Fuentes 2016).

Although price and differentiation in isolation feed the online review, the joint effect of both variables can awaken in the consumer the belief that is paying for additional services, which generates a negative sentiment towards price increases and greater product differentiation. Thus, we extend Fruchter, Gerstner, and Dobson's (2011) add-on analysis to its implications for communication.

The study further contributes to the PWoM literature by examining the effect of agglomeration on the online review rating, as it expands previous contributions just focused on the effect of volume of PWoM associated with a higher degree of crowding (Liu, Steenkamp, and Zhang 2018). The effect of agglomeration on volume and rating is relevant from the perspective of marketing communication as both cues allows increasing the perceived credibility of OPRs (Hong and Pittman 2020). However, a higher concentration can cause a decrease in the distance between competitors, which paradoxically can lead to a decrease in online rating, so opposite effects can appear due to the agglomeration of competitors.

Managerial implications

Managerially, the findings of the research can be utilized by communication managers. While the focus of many advertising agencies is to find a proper right message, or better 'the barrage of online messages' (Kitchen and Tourkey 2020, 12), seeking other contacts consumers may have. In this way, the market offer deserves a role as axis of a marketing communication plan due to their role as quality signals. Thus, a premium price does not imply a negative evaluation by users, with high-priced products could receive a better online review. However, marketers must be careful when communicating pricing of additional features (i.e., add-ons). Specifically, they should consider the value to consumers of those features and the competitive environment.

This research complements recent work that finds that the concentration of competitors increases the volume of online review (Liu, Steenkamp, and Zhang 2018). Our results show that higher competitors' agglomerations increase the rating too, promoting OPR as

a marketing communication tool, with potential advertising costs savings derived. However, this effect implies some limits, since an over-agglomeration can be counter-productive for both volume and rating (e.g., fake reviews). Though location decisions depend on many factors, we further find that firms can gain location rents due to more distant competitors and a reduced advertising budget required (Yoo and Mandhachitara 2003), enhancing OR as a communication tool. Then, firms should adapt their marketing communication to the type of location and level of competition.

The positive influence of company experience shows its usefulness as the basis of firm's communication. Also, in case of premium price strategies, the confirmed role of price in delivering a signal and OPRs join forces to guarantee the promise communicated.

Limitations and directions for further research

The limitations associated with this study offer scope for future research. First, authors recommend that future research consider non-linear effects of the number of competitors for a more in-depth analysis of the impact of competition on online reputation. Second, due to the dynamic nature of OPRs, the lack of this feature emerges as a limitation. Finally, this work has been developed within a pre-COVID-19 context. However, the hospitality and many other industries are undergoing dramatic changes due to this pandemic (Kitchen et al. 2021).

An extension of this work could consider what is the optimal agglomeration level through the optimal trade-off between number of competitors and distance among them to attain the best rating. Another extension would be to incorporate customer characteristics, behaviors, consumption occasions and how to communicate add-on pricing. In particular, due to the utmost importance of trust between marketers and their customers (MSI 2020), since OPRs can be reduced their credibility due to perceived deceptive practices (Karabas et al. 2020), it would be valuable to take into consideration an information trustworthiness indicator, in order to avoid altering the utility of OPRs. This concern also gives rise to assess the value of OPR as an informational device that cues certain meaning (Duncan and Moriarty 1998).

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Appendix

Table A1. Summary of differentiating features included in the service vector Si.

Sport		Meals	Hotel Style
Aerobics	Jet skis	All-inclusive	Airport hotel
Animation activities	Kayak	Bed and breakfast	Beach hotel
Aquatic Gymnastics	Mini golf	Buffet lunch	Business hotel
Archery	Paddle	Continental breakfast	Conference hotel
Badminton	Pedal boat	Diet food	City hotel
Basketball	Petanque	Dinner a la carte	Design hotel
Bicycle bike of montain	Ping pong	Dinner from menu to	Ecological hotel
Billiard american or russian	Ride to horse	Choose	Family hotel
Boat to motor	Sailing	Dinner type buffet	Farm hotel
Bowling alley	Sports shooters	Drink included	Golf hotel
Catamaran	Squash	Full board	Historic hotel
Children's animation	Surf	Half board	Holiday complex
Darts	Tennis	Lunch a la carte	Resort
Diving	Tennis de table	Lunch from menu to	Romantic hotel
Golf	Volley beach	Choose	Rural housing
Gymnastics	Volleyball	Menu a la carte	Sky hotel
Handball	Water skiing	Special packages	Spa hotel
Hiking	Windsurf		Thematic hotel
Horse riding			Casino hotel