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## **The saturation effect in hotel managerial response**

### **Abstract**

Hotel booking platforms widely adopt managerial response. The literature supports its positive effect on product/service evaluations, but the question of a potential saturation effect and its implications are yet to be analyzed. The present study fills this gap by empirically analyzing 4,888 hotels and over two million hotel reviews and finds that 1) managerial response enhances future ratings of hotels with low rating with a diminishing marginal utility, 2) the effect of managerial response on reducing rating fluctuation mainly works for hotels with high variance, and 3) the effectiveness of managerial response in enhancing the rating valence and reducing the rating variance of a hotel weakens when dealing with experienced consumers. These findings provide direct implications for hotel booking platforms and hotel managers.

**Keywords:** Hotel booking platforms; Managerial response; Consumer rating; Consumer experience; Saturation effect

## 1. Introduction

Online review (generated by consumers) and managerial response (produced by managers) are two important channels for potential consumers to acquire information before making booking decisions, especially for experience product/service in hospitality (Chan et al., 2017; Ahani et al., 2019; Shin et al., 2019; Zhang et al., 2021). A potent component of online review is the numeric rating, which significantly influences hotel performance (Li et al., 2020; Lui et al., 2018). High ratings refer to high satisfaction, and low rating variance refers to consistent evaluations from consumers. Therefore, continuously and consistently receiving high ratings is the dream of every product/service provider.

In academic research and business practice, managerial response is an effective and low-cost manner of realizing the above dream because it helps enhance the customer-firm relationship, customer satisfaction, and online customer engagement (Chen et al., 2019; Wang & Chaudhry, 2018). Extant studies have revealed the positive effect of managerial response on hotel performance. However, this positive effect should not be assumed to be uniform because managerial response may not always be beneficial or may sometimes not function well in business practice. For example, for hotels with high ratings, consumers may have high expectations of their quality and service, reducing the effectiveness of their online reputation management (e.g., managerial response). Experienced consumers may distinguish high-quality from low-quality hotels and consequently form a high or low standard toward the service and management of a hotel **without the usage of other information, such as managerial response, reducing the** capability of managerial response to influence their behavior (Dagger & O'Brien, 2010; Utz et al., 2012). Therefore, the effectiveness of managerial response in different situations remains unclear and deserves further exploration.

This study attempts to fill the literature gap by posing two research questions: The first research question asks *whether the saturation effect exists and, if so, how it affects the effectiveness of managerial response*. According to Global Hotel Reputation Benchmark Report (2018), with the analysis of 77 million reviews over 138,000 hotels in 200 countries in 2017, hoteliers responded to 29.7% of the reviews from sites that allow managerial response. Notably, the response rate of hoteliers in the Asia Pacific is over 40%, followed by Latin America (39%), Europe, the US, and Canada (25%). This report shows that the level of maturity of this practice has reached globally. Under these relatively high response rates, some consumers must have been used to various managerial responses, especially in markets with the highest managerial response rates. Thus, in line with the findings of Liu and Yang (2009),

the effect of further stimuli from managerial response could be expected to drop or lose efficacy, leading to a saturation effect.

The second research question asks *whether the effectiveness of managerial response weakens when dealing with experienced consumers*. Literature has shown that user experience determines the effect of online reviews on their decision-making process (Filiari, 2016). We expect the saturation effect to be accentuated when dealing with experienced consumers because they can evaluate a product or service by their experiences rather than by managerial response, even more so when they encounter the latter in excess (Dagger & O'Brien, 2010). In contrast, inexperienced consumers are more likely to read online reviews and managerial responses before purchasing decisions (Utz et al., 2012).

Thus, to test the saturation effect, this study explores its nuances and consequences, undocumented in previous studies, thereby filling a critical gap in the literature. This study also bridges the saturation effect (Stang, 1974; Ulrich et al., 1998), norm theory (Cadotte et al., 1987; Sarra et al., 2015), and consumer experience (Filiari, 2016) in the context of managerial response. The results of this study add knowledge to the literature on managerial response and consumer experience and extend the implications of the saturation effect and norm theory into managerial response. Apart from this theoretical contribution, this study is one of the first attempts to show the effect of managerial response on reducing rating variance, a fundamental index among hospitality-related products/services. From a practical viewpoint, the findings of this study offer direct implications for hotel managers and hotel booking platforms, given that managerial response may be saturated in the current business practice of some regions or industries.

## **2. Literature review, theory, and hypothesis development**

Online review plays a determinant role during decision-making and have attracted significant academic attention (Luca & Zervas, 2016; Tsai et al., 2020; Zeng et al., 2020). For a product or service, the number of reviews indicates its popularity and thus is the potential to drive its sales (Li et al., 2020; Lui et al., 2018; Minnema et al., 2016). The importance of online review encourages studies to identify how to motivate users to contribute more reviews (Davis & Agrawal, 2018). For example, setting incentive hierarchies (Goes et al., 2016) and employing monetary incentives (Hu & Kim, 2018) can motivate users to contribute more content. A distinctive feature of online reviews is the numeric rating, which is easily observed (Yin et al., 2016). Therefore, the metrics concerning numeric rating have received considerable

interest from academia. The valence and variance of the historical ratings of specific products or services from various online platforms are the primary and direct measures employed in recent studies. Review valence, usually calculated by the monthly or quarterly average of historical ratings, is the most straightforward indicator of the numeric rating (Zeng et al., 2020). Review valence is a proxy of customer satisfaction and is positively associated with purchase intention and online sales (Li et al., 2020; Lui et al., 2018; Minnema et al., 2016). **For example, a one-point increase in the review score of a hotel is related to a 7.5% increase in its reservation rate (Viglia et al., 2016).** Review variance refers to rating fluctuation and the degree of consensus among consumers' evaluations of a product or service (Minnema et al., 2016; Xu et al., 2020). Related studies have found an inconsistent influence of review variance on firm performance. For example, high review variance indicates a product's uncertain quality and reduces consumers' purchase intention (Wang et al., 2015; Ye et al., 2009). However, under certain situations, high review variance may benefit the firm by securing demand from well-matched consumers (Sun, 2012).

To capitalize on online review and manage customer relationships better, firms usually employ managerial response, **which positively impacts customer satisfaction (Zhao et al., 2020).** Specifically, **managerial response** strengthens the benefit of positive reviews and attenuate the damage of negative reviews (Proserpio & Zervas, 2017; Xie et al., 2017; Shin et al., 2019). For example, when responding to positive reviews, managerial response reinforces the compliments in the reviews and further improves customer satisfaction (Xie et al., 2014). On the contrary, in the case of negative reviews, managerial response is similar to the process known as service recovery, which helps firms restore customer satisfaction by assuring that the experiences described in the reviews will not repeat (Chevalier et al., 2018; Mathis et al., 2016). Therefore, employing managerial response helps enhance the future ratings of a hotel (Chen et al., 2019). Related studies have also investigated the interactive effects between managerial response and other factors on customer sentiment and firm performance (Xu et al., 2020). For example, Lui et al. (2018) found that the impact of managerial response on hotel booking becomes especially strong with extreme ratings. **For a managerial response with a strong argument, its positive influence on subsequent reviews will be reduced by the high emotional arousal expressed in the related review (Huang et al., 2020).** Furthermore, the effect of managerial response can be moderated by some hotel-level characteristics, such as hotel category (budget hotels vs. premium hotels) (Li et al., 2017). **However, Mauri and Minazzi (2013) found that managerial response negatively affects consumers' purchase intention through an experimental study.**

Managerial response, as a communication strategy, can be affected by a saturation effect. Generally defined as a decreasing influence of a stimulus because of its higher exposure frequency (Ulrich et al., 1998; Stang, 1974), the saturation effect comes from adaptation-level theory stating that quantity can determine the organism response evoked by a stimulus (Helson, 1948). The saturation effect has been a central pillar in marketing and involves several aspects, including product life cycle, discount, and advertising strategy (Gupta & Cooper, 1992; Liu & Yang, 2009; Kalish, 1983). For instance, the temporal patterns of word-of-mouth effects on product demand and price can be explained by the saturation effect. For a typical durable product, positive word-of-mouth can initially increase its demand and price. However, later in its life cycle, the saturation effect takes over, and its demand and price decrease (Kalish, 1983). Furthermore, a firm's specific advertising strategy will lose its advantage when such strategy becomes more universal and customers have adapted to it with the firm's constant usage of the strategy (Liu & Yang, 2009). Similarly, given that managerial response is a typical hotel online strategy that builds communication between hotels and customers, its excessive usage may induce a saturation effect. Customers and potential consumers tend to get used to it, thereby reducing the effectiveness of future managerial responses.

### *2.1 Managerial response, saturation effect, and rating valence*

Generally, consumers can be classified into three types according to their use of online reviews, and managerial response works differently across every kind of consumer. First, managerial response will guarantee customers who post negative reviews/ratings after a dissatisfying experience that the hotel has noticed the problems and has addressed them with suitable solutions (e.g., apology and compensation) and that these negative experiences will not happen in the future (Chevalier et al., 2018; Xie et al., 2014). Thus, a hotel can turn dissatisfied consumers into loyal ones, which can potentially enhance the hotel's future ratings. Second, managerial response can also be employed to address positive reviews. For consumers who post positive reviews/ratings, managerial response is an effective channel to strengthen the interactions between a hotel and its consumers (e.g., thanking for the appreciation shown by consumers and welcoming and encouraging them to come again). These interactions help to enhance consumers' positive memories and impressions of the hotel, which is vital for revisit and re-evaluation (Xie et al., 2014). The third type of consumers involves those who have not purchased yet. For these potential consumers, searching and reading online reviews to make informed purchase decisions is common (Shin et al., 2019; Zeng et al., 2020). During this

process, managerial response conducted by hotel managers are noticed by these potential consumers and may make them perceive that the hotel cares and listens to its customer base, forming a good impression of the hotel (Min et al., 2015). Furthermore, managerial response provides additional information from the hotel managers, reducing uncertainty for potential consumers to make booking decisions (Li et al., 2017). Therefore, managerial response exerts a positive effect in enhancing the future rating valence of a hotel. However, according to the saturation effect (Ulrich et al., 1998; Stang, 1974), a decreasing effect of a stimulus (managerial response) can be expected because of a higher exposure frequency. In other words, after a threshold, managerial response could fail to bring about the enhancement of rating valence, leading to a diminishing marginal utility. Therefore, the marginal effect of managerial response on the future ratings of a hotel should be diminishing. Thus, we make the following hypothesis:

**H1a.** Managerial response enhances the rating valence of a hotel, but its marginal effect is diminishing.

The rating of a hotel on booking platforms refers to the average of all ratings posted by its consumers, reflecting the extent to which consumers were satisfied with the products or services offered by the hotel (Shin et al., 2019; Zeng et al., 2020). High ratings indicate that consumers have reached a positive agreement about the hotel (Liu, 2006). The saturation effect is likely to take place in this case of high ratings. For example, if the ratings of a hotel were positive, **the hotel may have conducted extensive managerial responses. Further stimuli with the usage of managerial response may not work, making managerial response lose efficacy and leading to a saturation effect.** In contrast, a low rating of a hotel indicates that a large proportion of consumers were not satisfied with the hotel, which conveys a negative online reputation and **suggests that the hotel has greater room** for improvement (Resnick et al., 2000). Under this situation, **the hotel needs to take some actions to improve customer satisfaction and online reputation.** Through managerial response, hotel managers can comfort dissatisfied consumers and provide additional information to signal positive changes in the future **rather than simply strengthening the emotions of satisfied customers or increasing the interaction with customers** (Zhao et al., 2020). In other words, **the usage of managerial response for a low-rating hotel is more necessary and effective.** Thus, we propose the following hypothesis:

**H1b.** The enhancement of rating valence via managerial response is more salient for hotels with a low rating.

## *2.2 Managerial response, saturation effect, and rating variance*

From the arguments presented in hypothesis H1a, adopting managerial response benefits a hotel because it conveys the idea that the hotel cares about customers and values their opinions, with the consequent positive attitude toward the property and good impression of the hotel (Mathis et al., 2016; Shin et al., 2019). Thus, their hotel evaluations after purchase may become more positive because consumers may be more receptive and have a greater positive predisposition toward the hotel. Receptiveness and predisposition will be maintained after their stay in the hotel, as long as their expectations are satisfied. Therefore, managerial response can guide consumer evaluations consistently and reduce the differences among these evaluations. Furthermore, the positive effect of managerial response on enhancing the ratings of a hotel documented in H1a is expected to reduce the fluctuation of the ratings. Given that rating variance refers to rating fluctuation or rating inconsistency (Sun, 2012), the usage of managerial response can reduce the inconsistency or fluctuation among consumer ratings. Thus, we have the following hypothesis:

**H2a.** Managerial response reduces the rating variance of a hotel.

Prior studies have found a negative impact of rating variance on hotel evaluation and attributed this negative influence to consumers' perception of uncertainty (Ye et al., 2009). Subsequent research has suggested that high rating variance indicates a high possibility that the hotel does not match potential consumers' preferences, which increases their perceived risks (Wang et al., 2015). Thus, when severe rating fluctuation of a hotel is observed, in line with the general model of external consumer information search proposed by Schmidt and Spreng (1996), potential consumers need more information to **address the high** perceived **uncertainty and risks toward the hotel**. On hotel booking platforms, besides peer evaluations, managerial response is the most crucial channel for potential consumers to acquire further information **about a hotel, which is helpful** to reduce information asymmetry **and alleviate customers' perceived uncertainty** (Li et al., 2017; Wang & Chaudhry, 2018). Thus, **with** high rating fluctuation for a hotel, potential consumers are likely to **refer to** managerial responses, increasing the importance and effectiveness of managerial response in relieving uncertainty and information asymmetry. **A high rating variance of a hotel also signals a greater room for improvement. In this case, managerial response is more necessary and becomes more effective**

**in relieving potential uncertainty and risk from potential consumers.** However, in the case of low rating variance, wherein convergent consumer evaluations of a hotel have been reached, a previously conducted managerial response may affect this low rating variance, and the effect of further stimuli from managerial response would be less likely to occur (saturation effect). Thus, we propose the following hypothesis:

**H2b.** The reduction of rating variance via managerial response is more salient for hotels with high variance.

### *2.3 Moderating effect of consumer experience and saturation effect*

In the online environment, consumer experience refers to the time and intensity a consumer uses the Internet and their purchase records (Filieri, 2016). Purchasing and posting reviews after consumption involve reading peer comments and communicating with sellers. A large amount of variation is found in the quality of online information (Luca & Zervas, 2016). Experienced consumers have a relatively intensive usage of the Internet and have been exposed to information of varying quality. Thus, they can better evaluate the online information and are less likely to weigh heavily on a single piece of information (Dagger & O'Brien, 2010). In other words, some information that is important to inexperienced consumers may not be valuable to and affect experienced consumers. On e-commerce platforms, inexperienced consumers, compared with experienced ones, are likely to use others' feedback to infer product or service quality (Utz et al., 2012). Extending this relationship to our research context, experienced consumers (those with rich purchase experience and high status on a platform) **may have established strong ties with the platforms and formed specific standards to evaluate the hotels (Sheng et al., 2019).** Furthermore, **experienced consumers** may distinguish high-quality from low-quality hotels by themselves and are less likely to rely on others' opinions. However, inexperienced consumers may need others' feedback to infer the quality of hotels. Thus, managerial response, an important information source to help consumers evaluate hotels (Chen et al., 2019), may be more useful to inexperienced customers than experienced customers. In other words, inexperienced consumers are more sensitive to managerial response and are less likely for managerial response to influence the rating behavior of experienced consumers.

According to norm theory, norms serve as references in judging a product, and dissatisfaction occurs when actual experiences disconfirm these norms (Cadotte et al., 1987).

With consumers with rich experience being more demanding, firms must make extra effort to create real experiences that meet these consumers' high norms and satisfy them (Goes et al., 2016). In our research context, experienced consumers may also have high norms/expectations regarding the managerial responses conducted by hotel managers. Consequently, the influence of managerial response on the rating behavior of experienced consumers (in rating valence and rating variance) should be expected to be lower than the case of inexperienced consumers. Accordingly, we propose the following hypotheses:

**H3a.** User experience weakens the effect of managerial response in enhancing rating valence.

**H3b.** User experience weakens the effect of managerial response in reducing rating variance.

### **3. Data and methodology**

#### *3.1 Data and variable*

We collect data from Ctrip.com (NASDAQ: CTRP), the largest hotel booking platform in China that covers over 1.2 million hotels and over 400 million registered members (Source: Ctrip.com). A Python-based crawler is developed to collect the dataset used in this study. First, we retrieve all hotels listed at Ctrip.com in Beijing, the capital city of China. Second, we select star-rated hotels and download reviews posted on these hotels from April 2015 to December 2017. Third, we also acquire the information of managerial response and the poster of each review. Fourth, we exclude reviews with missing data to ensure the dataset quality. As a result, we obtain data for 4,888 hotels with 2,102,376 reviews and 1,194,486 managerial responses. The numbers result in a 56.8% (sectional) managerial response to the reviews, which is a percentage in line with the 40% found by the Global Hotel Reputation Benchmark Report (2018) for the Asia Pacific region. This high figure warrants the testing of the saturation effect. Finally, we aggregate these observations and construct a panel dataset (hotel  $\times$  month), which is unbalanced because the entry time of each hotel is different.

**Review valence (rating valence) is a direct measure of satisfaction, usually calculated by the monthly or quarterly average of the historical ratings of a product or service (Zeng et al., 2020). Accordingly, we use the monthly average of consumer ratings (ranges from one to five) to measure satisfaction (*Valence*) and the monthly variance of consumer ratings to evaluate rating fluctuation (*Variance*).** The independent variable of interest is the proportion of managerial response (*MR*), which is calculated by the number of managerial responses divided

by the number of consumer reviews for hotel  $i$  in month  $t$ . This variable reflects the willingness and the effort of a hotel in managing a hotel-customer relationship.

This study also introduces a moderating variable, consumer experience, calculated by the average badge rank of each poster for hotel  $i$  in month  $t$ . Three badge ranks are issued according to consumers' posting activities at Ctrip.com. The "New Reviewer" badge is issued once one review is posted, and the "Talent (Expert) Reviewer" badge is given after posting 5 (30) reviews. The badge rank is a direct indicator of experience as each review represents one consumption. Ctrip.com only allows the ones who stayed at the hotel to post reviews on their bookings. To conduct empirical analysis, we convert the badge ranks into their numerical equivalent values, ranging from 0 (consumers without reviews) to 3 (1=new reviewer, 2=talent reviewer, and 3=expert reviewer).

Although the hotel fixed effect and month fixed effect account for the disparities across hotels and the time-varying factors, we also control for other variables that may influence user online behavior. The length of each review and the number of photos uploaded in each review reflect the amount of information contained in online reviews and may influence the perception and behavior of potential consumers (Mudambi & Schuff, 2010; Fang et al., 2016). Thus, these two factors are included as control variables. We also control the seasonality effect in the empirical analysis as consumers traveling across different seasons may travel with different motivations and have different service provider expectations; thus, they may form different evaluations toward the hotel (Juaneda et al., 2011). Furthermore, consumers with varying purposes of travel may focus on various hotel attributes and provide different evaluations toward the hotel; thus, we include travel type as control variables (Xu et al., 2017). Table 1 presents the variables used in this study.

*Insert Table 1 about here*

### *3.2 Econometric model*

Given that managerial response may have a two-way causal relationship with the dependent variables used, we use the lagged managerial response in all regressions to avoid this potential reverse causality problem. The specific rating regarding service, cleanliness, facility, and location are used to conduct robustness analysis. In Models 1–4,  $i$  stands for hotel,  $t$  represents month,  $\mu_i$  is hotel fixed effect,  $\nu_t$  is month fixed effect, and  $\varepsilon_{it}$  is the idiosyncratic error term. The econometric models are as follows:

$$Valence_{i,t} = \beta_{10} + \beta_{11}MR_{i,t-1} + \beta_{12}MR_{i,t-1}^2 + \beta_{13}Controls_{i,t} + \mu_i + v_t + \varepsilon_{i,t} \quad (1)$$

$$Variance_{i,t} = \beta_{20} + \beta_{21}MR_{i,t-1} + \beta_{22}Controls_{i,t} + \mu_i + v_t + \varepsilon_{i,t} \quad (2)$$

$$Valence_{i,t} = \beta_{30} + \beta_{31}MR_{i,t-1} + \beta_{32}MR_{i,t-1} * Exp_{i,t} + \beta_{33}Exp_{i,t} + \beta_{34}Controls_{i,t} + \mu_i + v_t + \varepsilon_{i,t} \quad (3)$$

$$Variance_{i,t} = \beta_{40} + \beta_{41}MR_{i,t-1} + \beta_{42}MR_{i,t-1} * Exp_{i,t} + \beta_{43}Exp_{i,t} + \beta_{44}Controls_{i,t} + \mu_i + v_t + \varepsilon_{i,t} \quad (4)$$

The objective of Model 1 is to test H1a and identify the significance of  $\beta_{11}$  and  $\beta_{12}$ , which represent the direct and marginal effect of managerial response on rating valence, respectively. According to H1b, we expect that the significance and magnitude of  $\beta_{11}$  and  $\beta_{12}$  would be more evident among the samples with low ratings. In Model 2, we aim to estimate the significance of  $\beta_{21}$ , which captures the effect of managerial response on reducing rating fluctuation. We also expect that the significance and magnitude of  $\beta_{21}$  would be more salient among the samples with high variance according to H2b. Models 3–4 are employed to test the moderating effect of consumer experience, which is captured by  $\beta_{32}$  in Model 3 and  $\beta_{42}$  in Model 4.

## 4. Results and discussion

### 4.1 Descriptive statistics

Table 2 reports the summary statistics of the main variables (hotel  $\times$  month) used in this section. The average rating valence is approximately 4.22, indicating that most of the consumer ratings are positive. The average rating variance (0.82) is relatively small compared with their maximum values, suggesting that consumer ratings are not excessively dispersed. The monthly average proportion of managerial responses conducted by hotel managers is approximately 41.4% (monthly panel). This result indicates that a high proportion of consumer reviews received managerial responses. Thus, managerial response becomes a common practice in the hotel sector.

*Insert Table 2 about here*

## 4.2 Empirical results

### 4.2.1 Results: Rating valence (H1)

Table 3 reports the regression results based on Model 1. As Column 1 (without control variables) and Column 2 (with control variables) show, the coefficients of  $MR_{t-1}$  and  $MR_{t-1}^2$  are significant. The former is positive, and the latter is negative. Therefore, managerial response exerts a positive effect on hotel ratings, but its marginal effect is diminishing, giving rise to a nonlinear effect. Thus, H1a is supported. To test H1b, we divide the whole sample into three groups (low, middle, and high) according to the monthly rating valence of each hotel and run the same regression as in Column 2. As Columns 3–5 show, the coefficients of  $MR_{t-1}$  and  $MR_{t-1}^2$  are only significant for hotels with a low rating (Column 3). These results suggest that the effectiveness of managerial response in enhancing hotel ratings mainly exists in the case of low ratings. Thereby, H1b is supported. In sum, our results confirm the positive effect of managerial response on enhancing hotel ratings. However, managerial response's positive effect mainly occurs within hotels with low ratings, diminishing its marginal effect.

*Insert Table 3 about here*

### 4.2.2 Results: Rating variance (H2)

Table 4 presents the regression results based on Model 2. The coefficients of  $MR_{t-1}$  in Column 1 (without control variables) and Column 2 (with control variables) are negative and significant, suggesting that managerial response reduces the rating variance. Thus, H2a is supported. We then divide the whole sample into three groups (low, middle, and high) according to the monthly rating variance of each hotel as in Table 3. We run the same regression as in Column 2 to test H2b. We observe that the coefficient ( $-0.0563^{***}$ ) of  $MR_{t-1}$  is only significant for the hotels with high variance in Column 5. Therefore, H2b is supported that the effectiveness of managerial response in reducing rating variance is more salient for hotels with high variance.

*Insert Table 4 about here*

#### 4.2.3 Results: Moderating effect (H3)

To explore the moderating effect of consumer experience, Table 5 presents the estimation results of Model 3 (Columns 1–2) and Model 4 (Columns 3–4). As reported in Column 1 (without control variables) and Column 2 (with control variables), the coefficients of  $MR_{t-1} * Exp$  are negative and significant at the 0.01 level, indicating that the positive effect of managerial response on enhancing the future rating valence of a hotel weakens when confronting experienced users. Thus, H3a is supported. The coefficients of  $MR_{t-1} * Exp$  in Column 3 (without control variables) and Column 4 (with control variables) are positive and significant, suggesting that the effect of managerial response on reducing the future rating variance of a hotel also weakens when encountering experienced users. Thus, H3b is supported.

*Insert Table 5 about here*

#### 4.3 Robustness analysis

To validate the robustness of the results in Section 4.2, we first use the specific ratings (*Location, Facility, Service, and Cleanliness*) instead of the overall rating of a review to reconstruct the dependent variables (*Rating Valence* and *Rating Variance*). We replicate the results in Column 2 of Table 3 and Table 4 to check the robustness of H1a and H2a. The results in Columns 1–4 of Table 6 show that, except for the coefficient of  $MR_{t-1}^2$  that is not significant in Column 4 (and only significant at 10% in Column 2), the sign and significance for other coefficients of interest are consistent with those in Column 2 of Table 3. Furthermore, the results in Columns 5–8 of Table 6 are essentially the same as those in Column 2 of Table 4. Thus, the empirical results reported in Table 6 indicate the robustness of H1a and H2a.

*Insert Table 6 about here*

To check the robustness of H1b and H2b, we conduct quantile regressions and present these results in Table 7. The results in Columns 1–2 (Columns 3–4) are essentially the same as those in Columns 3–5 of Table 3 (Table 4), suggesting that the positive effect of managerial response on promoting rating valence and reducing rating variance is salient among hotels with low rating or high variance. Thus, the results of H1b and H2b are robust. Furthermore, we also performed the regression analysis using up to three lags ( $MR_{t-1}$ ,  $MR_{t-2}$ , and  $MR_{t-3}$ ) to examine

the timeliness feature of managerial response and present these results in Table 8. We observe that the magnitude of the coefficients decreases and becomes insignificant along with the increase of the lag period. Therefore, the effectiveness of managerial response is time-sensitive.

*Insert Tables 7–8 about here*

We then replicate the results in Column 2 (Column 4) of Table 5 using the specific ratings and report these results in Columns 1–4 (Columns 5–8) of Table 9. We find that the results in Table 9 are highly consistent with those in Table 5, suggesting that the results of H3a and H3b are stable.

*Insert Table 9 about here*

## **5. Conclusion and implications**

Extant studies have shown that managerial response is a critical approach to enhancing future ratings in the hotel sector. Managerial response is widely adopted in business practice because most hoteliers actively read and respond to consumer reviews. The response rate (>40%) is exceptionally high in the Asia Pacific. In such a mature market, we ask whether the saturation effect of managerial response applies. To answer this question, we collect data from Ctrip.com (the largest hotel booking platform in China) and construct a large-scale panel dataset (hotel  $\times$  month) by including consumer reviews and managerial responses.

We use the rating valence and rating variance of a hotel to measure the potential effectiveness of managerial response. The empirical results suggest that, although managerial response enhances the future hotel ratings, its marginal utility decreases. We then divide the whole sample into three groups (low, middle, and high) according to the monthly rating valence of each hotel. We find that the positive effect of managerial response on enhancing rating valence mainly exists for hotels with a low rating. According to the concept of saturation effect, further stimuli from managerial response may lose efficacy, especially for hotels with high ratings. Nevertheless, the saturation effect unlikely functions for hotels with considerably low ratings. In this case, managerial response is an efficient channel to promote the future ratings of a hotel. Next, we employ the rating variance to measure the monthly rating fluctuation of each hotel. We find that the effect of managerial response on reducing rating fluctuation mainly works for hotels with high variance. High rating variance for a hotel suggests evaluating

controversy among current consumers and indicates a high risk for potential consumers to make booking decisions. Potential consumers are more likely to read managerial responses to obtain extra information and make informed decisions. In this situation, the effectiveness and importance of managerial response to reduce uncertainty and information asymmetry could be enhanced. In contrast, low rating variance indicates that most current consumers reached convergent evaluations. Thus, potential customers barely require extra information for decision-making, limiting the effectiveness of managerial response. Finally, we test the moderating effect of consumer experience. The empirical results indicate that the effectiveness of managerial response in enhancing the rating valence and reducing the rating variance of a hotel weakens when encountering experienced consumers. On the one hand, experienced consumers can distinguish high-quality from low-quality of a product or service by their actual experiences. In contrast, inexperienced consumers tend to use online information (e.g., managerial responses and online reviews). On the other hand, experienced consumers have already received or noticed many managerial responses and have gotten used to these repetitive stimuli. Thus, the effect of further stimuli from managerial response is restrained according to the saturation effect. Therefore, the effectiveness of managerial response weakens among experienced consumers.

Theoretically, this study reveals the saturation effect in managerial response and how it affects the effectiveness of managerial response, which is undocumented in previous studies. For hotels with a high rating and low variance, the positive effect of managerial response on enhancing rating valence and reducing rating variance is limited. Apart from filling this gap, this study further validates the saturation effect by considering the possible influence of consumer experience. The empirical results suggest that experienced consumers are less sensitive to managerial response. This study also bridges norm theory and consumer experience in the context of managerial response. Experienced consumers have high norms or expectations of managerial responses, making managerial response less effective for them. These theoretical contributions add knowledge to the literature on managerial response and consumer experience and extend the implications of the saturation effect and norm theory into managerial response, offering new directions for future research. Furthermore, this study is among the first to reveal the effect of managerial response on reducing rating variance, which is a critical index that affects online sales.

From a practical point of view, the findings of this study offer direct implications for hotel managers and hotel booking platforms. First, hotel managers should evaluate the cost and benefit of conducting managerial response, which involves costs (e.g., human and training

costs). Hotel managers should balance and design a strategy when conducting managerial responses rather than blindly or should randomly respond to consumer reviews. Wang and Chaudhry (2018) showed that tailored managerial responses could amplify the positive effect of responses to negative reviews and lead to negative consequences, responses, and positive reviews. This study reveals that the benefit of managerial response could be quite small for hotels with high ratings and low variance. Thus, these hotels should evaluate whether managerial response should be a top priority or whether they could consider reducing—to some extent—their investment in time, money, and staff in charge of managerial response to save costs and optimize resources. Another strategy is to provide an improved stimulus to reach the saturation point later. That is, for example, high-quality managerial response can be improved by using timely responses (if that were the case) or utilizing responses with a human voice style (personalized or customized responses), which have been favorably received by consumers (Sparks et al., 2016). Doing so would increase the effectiveness of managerial response. In contrast, conducting managerial response is beneficial for hotels with low ratings and high variance; thus, they should put more effort—monetary and non-monetary—into managerial response to promote their future ratings and online reputation.

Second, hotel managers should be particularly cautious and diligent when responding to experienced consumers (it is easy to observe the experience level of each consumer through his/her profile). These consumers have faced and been confronted with various managerial responses and have gotten used to it. Many hotel managers usually provide uniform managerial responses, lacking customized responses. For experienced consumers, this kind of uniform managerial response is likely to lose efficacy.

Third, hotel booking platforms can provide visual statistics of managers' responses during a specific period to help hotel managers monitor basic metrics, such as their response rate or response speed. These indexes are fundamental for hotel managers to evaluate the cost, benefit, and effectiveness of managerial response. This implication is even more relevant today if we consider the two-sided market in which hotel booking platforms operate and the potential cross-side and same-side network effects that can be derived (Hinz et al., 2020). In the context of a two-sided market, an intermediary (e.g., a hotel booking platform), facilitates a platform that permits interaction between two types of entities (e.g., consumers and hotels) in such a way that the decisions of both groups have favorable implications for each other. For this purpose, the mere existence of the platform—in this case owned by the hotel booking platform—should provide the two entities with cross-side and same-side network positive effects. The two entities must find their participation in the platform beneficial.

This study also has some limitations that would require future research effort. First, the dataset employed in this study is collected from Beijing, a city in the Asia Pacific. The Global Hotel Reputation Benchmark Report (2018) shows that the response rate of hotels in the Asia Pacific is the highest (over 40%); thus, the saturation effect found is more likely to work. However, the response rate is just 25% in the US, Canada, and Europe. Therefore, whether the saturation effect in managerial response works for hotels in these areas remains unclear. Future research can further test the results obtained in this study by using data collected from these areas. Second, we only use the monthly response rate to measure managerial response in this study. Thus, the use of text mining or experiments to explore how different response patterns or strategies affect the effectiveness of managerial response would open up potential future lines of research.

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**Table 1**  
Variable description

Variable	Description
<b>Dependent variable</b>	
<i>Rating Valence (Valence)</i>	The average of consumer ratings for hotel <i>i</i> in month <i>t</i>
<i>Rating Variance (Variance)</i>	The variance of consumer ratings for hotel <i>i</i> in month <i>t</i>
<b>Explanatory variable</b>	
<i>Managerial Response (MR)</i>	The proportion of consumer reviews that received managerial response for hotel <i>i</i> in month <i>t</i>
<b>Moderator</b>	
<i>Consumer Experience (Exp)</i>	The average badge rank of consumers who post reviews for hotel <i>i</i> in month <i>t</i>
<b>Control Variable</b>	
<i>Length</i>	The average length of consumer reviews for hotel <i>i</i> in month <i>t</i>
<i>Photo</i>	The average number of photos uploaded for hotel <i>i</i> in month <i>t</i>
<i>Spring</i>	A dummy variable indicating whether the reviews are posted during spring (March, April, and May) in Beijing
<i>Summer</i>	A dummy variable indicating whether the reviews are posted during summer (June, July, and August) in Beijing
<i>Autumn</i>	A dummy variable indicating whether the reviews are posted during autumn (September, October, and November) in Beijing
<i>Business</i>	The proportion of business, friend, couple, family, and alone trips for hotel <i>i</i> in month <i>t</i>
<i>Friends</i>	
<i>Couple</i>	
<i>Family</i>	
<i>Alone</i>	

**Table 2**

Descriptive statistics

	Obs.	Mean/Proportion	S.D.	Min.	Max.
<i>Valence</i>	104129	4.2226	0.6930	1	5
<i>Variance</i>	90323	0.8204	0.9167	0	8
<i>MR</i>	104129	0.4141	0.4707	0	1
<i>Exp</i>	104129	1.6867	0.4716	0	3
<i>Length</i>	104129	28.4768	21.3298	1	393
<i>Photo</i>	104129	0.2136	0.5664	0	13
<i>Spring</i>	104129	23.44%	-	0	1
<i>Summer</i>	104129	27.77%	-	0	1
<i>Autumn</i>	104129	28.59%	-	0	1
<i>Business</i>	104129	0.4213	0.3106	0	1
<i>Friends</i>	104129	0.1089	0.1762	0	1
<i>Couple</i>	104129	0.1015	0.1742	0	1
<i>Family</i>	104129	0.1690	0.2369	0	1
<i>Alone</i>	104129	0.0828	0.1682	0	1

**Table 3**

Estimation results of H1a and H1b

Column	(1)	(2)	(3)	(4)	(5)
Sample	Whole	Whole	Low	Middle	High
Model	Model 1	Model 1	Model 1	Model 1	Model 1
Variable	<i>Valence</i>	<i>Valence</i>	<i>Valence</i>	<i>Valence</i>	<i>Valence</i>
$MR_{t-1}$	0.1051*** (0.0295)	0.1101*** (0.0291)	0.1882*** (0.0593)	0.0067 (0.0120)	-0.0102 (0.0138)
$MR_{t-1}^2$	-0.0584** (0.0290)	-0.0626** (0.0286)	-0.1588*** (0.0594)	0.0016 (0.0119)	0.0136 (0.0135)
<i>Length</i>		-0.0055*** (0.0002)	-0.0038*** (0.0002)	-0.0005*** (0.0001)	-0.0006*** (0.0001)
<i>Photo</i>		0.0433*** (0.0056)	-0.0080 (0.0109)	0.0123*** (0.0019)	0.0028** (0.0014)
<i>Spring</i>		-0.1649*** (0.0151)	0.2012*** (0.0309)	-0.0307*** (0.0055)	-0.0928*** (0.0067)
<i>Summer</i>		-0.1134*** (0.0143)	0.1496*** (0.0302)	-0.0087* (0.0053)	-0.0636*** (0.0046)
<i>Autumn</i>		-0.0353** (0.0148)	0.0742** (0.0330)	-0.0026 (0.0056)	-0.0215*** (0.0043)
<i>Business</i>		0.0491*** (0.0186)	0.0467* (0.0250)	-0.0127** (0.0058)	-0.0108** (0.0049)
<i>Friends</i>		0.2148*** (0.0227)	0.1478*** (0.0320)	0.0068 (0.0073)	-0.0031 (0.0058)
<i>Couple</i>		0.2119*** (0.0232)	0.1040*** (0.0345)	0.0134* (0.0073)	0.0031 (0.0058)
<i>Family</i>		0.2118*** (0.0210)	0.1775*** (0.0306)	0.0148** (0.0067)	-0.0161*** (0.0055)
<i>Alone</i>		0.0759*** (0.0248)	0.0972*** (0.0326)	-0.0005 (0.0078)	-0.0082 (0.0064)
Constant	4.1520*** (0.0107)	4.3515*** (0.0191)	3.4124*** (0.0316)	4.3941*** (0.0065)	4.8604*** (0.0054)
Hotel FE	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES
Obs.	99,225	99,225	32,775	33,393	33,057
R <sup>2</sup>	0.3400	0.3633	0.4142	0.2322	0.4818
F	28.64***	57.37***	19.96***	10.63***	27.14***

*Notes.* Robust standard errors are reported in parentheses. \*, \*\*, and \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively.

**Table 4**

Estimation results of H2a and H2b

Column	(1)	(2)	(3)	(4)	(5)
Sample	Whole	Whole	Low	Middle	High
Model	Model 2	Model 2	Model 2	Model 2	Model 2
Variable	<i>Variance</i>	<i>Variance</i>	<i>Variance</i>	<i>Variance</i>	<i>Variance</i>
<i>MR<sub>t-1</sub></i>	-0.0533*** (0.0107)	-0.0548*** (0.0106)	-0.0015 (0.0025)	0.0022 (0.0032)	-0.0563*** (0.0210)
<i>Length</i>		0.0049*** (0.0003)	0.0003*** (0.0000)	0.0005*** (0.0001)	0.0025*** (0.0006)
<i>Photo</i>		-0.0507*** (0.0098)	-0.0043*** (0.0014)	-0.0081** (0.0033)	0.0092 (0.0241)
<i>Spring</i>		-0.1082*** (0.0232)	0.0672*** (0.0055)	0.0044 (0.0072)	-0.5336** (0.0482)
<i>Summer</i>		0.0485** (0.0235)	0.0545*** (0.0046)	-0.0008 (0.0072)	-0.3393*** (0.0466)
<i>Autumn</i>		0.0208 (0.0250)	0.0187*** (0.0044)	-0.0001 (0.0078)	-0.0713 (0.0506)
<i>Business</i>		-0.0896*** (0.0344)	0.0188*** (0.0053)	0.0172** (0.0083)	-0.1230* (0.0649)
<i>Friends</i>		-0.2240*** (0.0422)	-0.0018 (0.0064)	0.0146 (0.0108)	-0.2105** (0.0830)
<i>Couple</i>		-0.1070** (0.0450)	-0.0009 (0.0066)	0.0115 (0.0109)	-0.0073 (0.0883)
<i>Family</i>		-0.3116*** (0.0383)	0.0074 (0.0060)	0.0037 (0.0099)	-0.4412*** (0.0765)
<i>Alone</i>		-0.1181** (0.0469)	0.0105 (0.0071)	-0.0004 (0.0118)	-0.1818** (0.0855)
Constant	0.7706*** (0.0146)	0.8885*** (0.0342)	0.1154*** (0.0056)	0.5530*** (0.0093)	2.0773*** (0.0644)
Hotel FE	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES
Obs.	86,938	86,938	28,769	29,098	29,071
R <sup>2</sup>	0.2393	0.2458	0.3614	0.1898	0.3693
F	8.95***	15.38***	18.75***	3.44***	15.29***

Notes. Robust standard errors are reported in parentheses. \*, \*\*, and \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively.

**Table 5**

Estimation results of H3a and H3b

Column	(1)	(2)	(3)	(4)
Model	Model 3	Model 3	Model 4	Model 4
Variable	<i>Valence</i>	<i>Valence</i>	<i>Variance</i>	<i>Variance</i>
$MR_{t-1}$	0.1650*** (0.0232)	0.1607*** (0.0229)	-0.1412*** (0.0401)	-0.1398*** (0.0399)
$MR_{t-1} * Exp$	-0.0693*** (0.0127)	-0.0660*** (0.0126)	0.0506** (0.0217)	0.0485** (0.0215)
<i>Exp</i>	0.0244*** (0.0087)	0.0434*** (0.0087)	-0.1200*** (0.0152)	-0.1419*** (0.0154)
<i>Length</i>		-0.0056*** (0.0002)		0.0050*** (0.0003)
<i>Photo</i>		0.0436*** (0.0056)		-0.0530*** (0.0098)
<i>Spring</i>		-0.1671*** (0.0151)		-0.0871*** (0.0232)
<i>Summer</i>		-0.1126*** (0.0143)		0.0466** (0.0235)
<i>Autumn</i>		-0.0340** (0.0148)		0.0170 (0.0249)
<i>Business</i>		0.0406** (0.0187)		-0.0533 (0.0345)
<i>Friends</i>		0.2138*** (0.0227)		-0.2281*** (0.0422)
<i>Couple</i>		0.2131*** (0.0233)		-0.1222*** (0.0450)
<i>Family</i>		0.2128*** (0.0211)		-0.3294*** (0.0383)
<i>Alone</i>		0.0760*** (0.0248)		-0.1275*** (0.0468)
Constant	4.1135*** (0.0186)	4.2847*** (0.0234)	0.9856*** (0.0308)	1.1094*** (0.0427)
Hotel FE	YES	YES	YES	YES
Month FE	YES	YES	YES	YES
Obs.	99,225	99,225	86,938	86,938
R <sup>2</sup>	0.3403	0.3638	0.2406	0.2477
F	28.31***	56.41***	10.57***	17.40***

Notes. Robust standard errors are reported in parentheses. \*, \*\*, and \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively.

**Table 6**

Robustness check of H1a and H2a

Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Model	Model 1	Model 1	Model 1	Model 1	Model 2	Model 2	Model 2	Model 2
Variable	<i>Valence</i> <i>Location</i>	<i>Valence</i> <i>Facility</i>	<i>Valence</i> <i>Service</i>	<i>Valence</i> <i>Cleanliness</i>	<i>Variance</i> <i>Location</i>	<i>Variance</i> <i>Facility</i>	<i>Variance</i> <i>Service</i>	<i>Variance</i> <i>Cleanliness</i>
$MR_{t-1}$	0.103*** (0.030)	0.118*** (0.034)	0.128*** (0.032)	0.090*** (0.031)	-0.049*** (0.012)	-0.058*** (0.012)	-0.069*** (0.013)	-0.066*** (0.012)
$MR_{t-1}^2$	-0.068** (0.029)	-0.064* (0.033)	-0.075** (0.032)	-0.039 (0.030)				
Hotel FE	YES	YES	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	99,225	99,225	99,225	99,225	86,971	86,971	86,971	86,971
R <sup>2</sup>	0.308	0.373	0.326	0.374	0.227	0.241	0.233	0.257
F	40.40***	58.96***	55.33***	49.52***	11.09***	14.77***	17.93***	16.02***

Notes. Robust standard errors are reported in parentheses. \*, \*\*, and \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively.

**Table 7**

Robustness check of H1b and H2b

Column	(1)	(2)	(3)	(4)
Quantile	25%	75%	25%	75%
Model	Model 1	Model 1	Model 2	Model 2
Variable	<i>Valence</i>	<i>Valence</i>	<i>Variance</i>	<i>Variance</i>
$MR_{t-1}$	0.5620*** (0.0456)	0.0315 (0.0275)	-0.0151** (0.0060)	-0.1008*** (0.0159)
$MR_{t-1}^2$	-0.3522*** (0.0430)	0.0142 (0.0265)		
Controls	YES	YES	YES	YES
Hotel FE	YES	YES	YES	YES
Month FE	YES	YES	YES	YES
Obs.	99,225	99,225	86,938	86,938

Notes. Robust standard errors are reported in parentheses. \*, \*\*, and \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively. The output of quantile regressions for panel data obtained by Stata (“qregpd”) does not provide the values of the constant,  $R^2$ , and F-statistic.

**Table 8**

The timeliness feature of managerial response

Column	(1)	(2)	(3)	(4)	(5)	(6)
Model	Model 1	Model 1	Model 1	Model 2	Model 2	Model 2
Variable	<i>Valence</i>	<i>Valence</i>	<i>Valence</i>	<i>Variance</i>	<i>Variance</i>	<i>Variance</i>
$MR_{t-1}$	0.0485*** (0.0065)			-0.0548*** (0.0106)		
$MR_{t-2}$		-0.0069 (0.0066)			0.0104 (0.0107)	
$MR_{t-3}$			0.0029 (0.0066)			0.0111 (0.0108)
Controls	YES	YES	YES	YES	YES	YES
Hotel FE	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Obs.	99,225	94,513	89,953	86,938	83,149	79,575
$R^2$	0.3633	0.3382	0.3591	0.2458	0.2398	0.2376
F	58.72***	25.53***	49.80***	15.38***	15.40***	14.87***

Notes. Robust standard errors are reported in parentheses. \*, \*\*, and \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively.

**Table 9**

Robustness check of H3a and H3b

Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Model	Model 3	Model 3	Model 3	Model 3	Model 4	Model 4	Model 4	Model 4
Variable	<i>Valence</i> <i>Location</i>	<i>Valence</i> <i>Facility</i>	<i>Valence</i> <i>Service</i>	<i>Valence</i> <i>Cleanliness</i>	<i>Variance</i> <i>Location</i>	<i>Variance</i> <i>Facility</i>	<i>Variance</i> <i>Service</i>	<i>Variance</i> <i>Cleanliness</i>
$MR_{t-1}$	0.132*** (0.024)	0.177*** (0.026)	0.167*** (0.025)	0.168*** (0.024)	-0.158*** (0.044)	-0.147*** (0.046)	-0.149*** (0.047)	-0.193*** (0.045)
$MR_{t-1} * Exp$	-0.057*** (0.013)	-0.072*** (0.014)	-0.066*** (0.014)	-0.068*** (0.013)	0.063*** (0.024)	0.051** (0.025)	0.046* (0.026)	0.073*** (0.024)
$Exp$	0.044*** (0.009)	0.055*** (0.010)	0.043*** (0.009)	0.033*** (0.009)	-0.169*** (0.017)	-0.179*** (0.018)	-0.185*** (0.018)	-0.166*** (0.017)
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Hotel FE	YES	YES	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	99,225	99,225	99,225	99,225	86,971	86,971	86,971	86,971
R <sup>2</sup>	0.308	0.373	0.326	0.374	0.229	0.243	0.235	0.259
F	39.86***	58.01***	54.42***	48.66***	13.33***	17.21***	20.23***	18.01***

Notes. Robust standard errors are reported in parentheses. \*, \*\*, and \*\*\* represent significance at the 10%, 5%, and 1% levels, respectively.