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# The Factors Affecting Writing Reviews in Hotel Websites

Hulisi Öğüt[a*] , Asunur Cezar[a]

*TOBB University of Economics and Technology, Ankara, 06530, Turkey*

**Abstract**

We aim to understand the people's motivation for writing the reviews in order to better explain drivers of WOM activities in the online channel for the successful implementation of the hotel marketing. For this purpose, we choose one of the popular tourist destinations: Paris. We collect data for empirical analysis from one of the biggest online hotel reservation website. Our analysis reveals that higher rating and lower price increases the propensity to write reviews. However, while the extreme rating and star score and star rating does not have any effect on the propensity to write a review. We have also found the evidence for the negative effect of larger room size on the propensity to write a review. These results imply that satisfaction rather than dissatisfaction increases people's motivation more for writing reviews in hotel websites. We briefly discuss the managerial implications of our results.

## 1. Introduction

Customers increasingly use e-commerce sites for purchasing many products and services and internet becomes preferred sales channel for many industries. Travel industry is one of the first and successful industries to use Internet for this purpose and studies show that online travel sales keep growing. With a 16% share, hotel accommodation is the second largest sales item after air travel among online travel sales and revenue generated through online hotel booking increases (Marcussen 2008).

It has been reported in many cases that WoM is very effective marketing tool. In hotel industry, most customers choose hotels based on recommendation of a friend and industrial report shows that word of mouth is one of the important factors in hotel selection decision (Barsky & Nash 2008).  Word of mouth of the product has long been discussed as the free marketing tools of the products. This medium of marketing is more convincing than traditional marketing tools as people experiencing the product information has no incentive to spread wrong information about the product. It has been found that WoM marketing was seven times as effective as newspapers and magazines, four times as effective as personal selling, and twice as effective as radio advertising in influencing people choices(Brown and Peter 1997).

* Corresponding author. Tel. + 90-312-292-4218   fax. +90-312-292-4104
Email address: hogut@etu.edu.tr

One of the forms of word of mouth in the cyber world is online reviews. Recent studies show that travel reviews are increasingly becoming an important factor in hotel selection by travelers. As indicated by Milan (2007), millions of travelers log on daily to Travel websites like Tripadvisor.com and experience web content through hotel generated photos, written text and hotel reviews by past customers. Milan (2007) indicates that 84% of people visiting a Travel website hosting consumer generated content have their hotel choices affected by what they see and online hotel shoppers find reviews and hotel and room photos much more convincing than other features of hotels.

Although there are some similarities between two forms of online reviews and WoM, there are significant differences between online review and WoM. For instance, while WoM is only effective within people's social network through verbal communication, online reviews can reach all the people having access to the internet. Furthermore, the effect of online reviews does not fade away with time and distance and it can be more detailed and durable as it reflects the opinions of more than one person in written form. Another difference is that while it is very difficult to measure the effectiveness of WoM, the metrics related to online reviews can easily be established (Bhatnagar & Ghose 2004, Duan et al. 2008). Thus, it is important to understand drivers of WOM activities in the online channel for the successful implementation of the hotel marketing. For this reason, we seek to understand the people's motivation for writing the reviews.

The remainder of the paper is organized as follows. First, we present relevant literature. Then, we discuss the hypothesis and their background. Next, we present our data and empirical results. Last section concludes the paper.

## 2. Literature Review

Many recent studies analyze the impact of online reviews on product sales by considering the review volume and review valence measured as customer rating or positive/negative user ratings. (Sen and Lerman 2007; Senecal and Nantel 2004). These studies in the movie and online book industry show mixed results. Some of the studies show that both the volume and review valence affect future sales. Among the earlier studies, Chevaliear and Mayzlin (2006) examine the effect of consumer reviews on relative sales of books at Amazon.com and BarnesandNoble.com and they find that an improvement in a book's customer rating in the website causes an increase in sales at that site. However, Chen et al. (2004) find the review valence does not affect future sales using the same data set from Amazon.com. In the movie industry, Liu (2006) has found that review volume is the driver of future box office sales. By separating the effect of online review as both the originator and the result of sales, Duan et al. (2008) find that both a sales and review valence significantly leads to higher review volume and higher review volume in turn results in higher sales. In a related study, Dellarocas et. al. (2007) show that a movie's total revenue can be effectively forecasted through the movie viewers' ratings and movie's revenue trajectory.

Few recent studies investigate the impact of online reviews on consumer's hotel selection decision. By using consideration set theory, Vermeulen and Seeger (2009) conduct an experimental study to analyze the effect of internet customer reviews to consumer decision making. Consideration set theory (Roberts & Lattin, 1991) states that customer decision making is multi-staged and at each subsequent stage (awareness/consideration/choice stage respectively) a customer narrows down available alternatives until she makes her final decision. They consider review valence (positive versus negative), hotel familiarity and the reviewer expertise as the construct of their study. They find that both negative and positive reviews enhance consumer awareness for hotels. Furthermore, positive reviews improve the attitudes toward hotels. Consequently, hotel reviews increase consumers' consideration of the hotel and this result is especially valid for lesser-known hotels as the exposure to reviews have limited effect for well known hotels. They also show that the impact of reviewer expertise is positive, albeit minor. Dickinger and Mazanec (2008) show that recommendations of friends and online reviews are the most two important drivers of online hotel booking. Ogut and Tas (2011) investigate the impact of star rating and customer rating on hotel room sales and prices and find that higher customer rating increases the online sales. However, higher star do not increases the online hotel room sales. They also show that there is a positive relationship between customer ratings and prices. Ghose et al (2011) illustrates how social media can be mined in order to generate a new ranking system in product search engines and propose a hotel ranking system that recommends products that provide on average the best value for the consumer's money.

Our paper is mostly related to Dellarocas and Narayan (2006) and Dellarocas et al. (2010). Dellarocas and Narayan (2006) study the people's propensity to engage in post-purchase online word-of-mouth in the movie industry. They show that higher movie's customer rating and extreme rating increases people's motivation for writing reviews.

Dellarocas et al. (2010) find that people are more likely to contribute for movies that are less and more successful. Our paper is different from these papers from the following respects. First, we investigate one of the most successful applications of e-commerce which is hotel industry. Second, the sales of rooms and writing the reviews take place at the same website. Thus, people can write their ex-ante and ex-post comments regarding hotel's service. Third, we investigate the effect of price and hotel specific characteristics such as room size. Fourth, the quality of service is measured in two different ways: star and customer rating.

## 3. Hypothesis

One of the determinants of satisfaction and dissatisfaction is the quality of the service. In our context, the quality of the hotels can be measured in two different ways. These are traditional way of star rating and digitized way of online customer ratings. National rating agencies have been established by local authorities to evaluate hotels on the basis of their intrinsic qualities and rank them according to a five or four star scale. As a quality measure, online customer ratings complement star feature by considering subjective quality dimensions such as how nice hotel staff is, comfort and cleanliness of the hotel room, facilities/services offered to customers ,value provided versus the price of the hotel and location.   Thus, we used both star and customer rating as a proxy for satisfaction. For this reason, we expect that

Hypothesis 1: The motivation for writing review will be high for hotels that have either low or high ratings.

Hypothesis 2: The motivation for writing review will be high for hotels that have either low or high stars.

Online reviews are considered as the counterpart of the word of mouth (WoM) in the cyber world as they share many similarities. However, we believe that there is subtle difference between online reviews and traditional WoM since it is possible to observe the quality of the product prior to purchase in online reviews. Thus, they will have lower (higher) expectation if the customer rating of the product is low (high). We expect the same affect for the star rating as well. As the positive and negative disconfirmation will be higher for high customer and star rating, we expect the propensity to write the review will be high for hotels that have high ratings. Dellocras et al.(2010) find the similar results in movie industry and stated that there is J type relationship between customer rating and the propensity to write review. For this reason, we expect that

Hypothesis 3: The motivation for writing review will be high for hotels that have high ratings.

Hypothesis 4: The motivation for writing review will be high for hotels that have high stars.

The relationship between the word of mouth communication and price has not been thoroughly investigated in the literature. As the price of the hotel decreases, people will become more satisfied or dissatisfied and they are more likely to write reviews on web page. As the price of the hotel increases, the people are less likely to write review as the quality of the hotel increases. For this reason, we expect negative relationship between price and the propensity to review. Thus, we can hypothesize that

Hypothesis 5: For the given quality, the motivation for writing review will be high for hotels that have lower price.

Model

We collected the data from one of the biggest online hotel web booking sites: www.booking.com. We choose Paris hotel as the source of our data sets since it is one of the most popular tourist destinations in the world. The dependent variable, the propensity to write a review is the likelihood that customer can write a review after staying in the hotel.

$$\text{Likelihood of Writing Review=} \frac{\text{Number of Review at Specific Time Interval}}{\text{Number of Booking at Specific Time Interval}}$$

Since number of booking at specific time interval can not be greater than number of booking at that time, this variable is restricted to be between 0 and 1. We can use the logistic function to model the relationship between dependent

variable(likelihood of writing review) and independent variables as in Dellarocas and Narayan (2006). Then, logit transformation of this relationship is given as

$$\ln\left(\frac{y}{(1-y)}\right) = \beta'X + u$$

One of the problems with this approach is that if y variable is 0 and 1, then logistic transformation of odds will be infinity. The other problem is that this function is not reversible in order to estimate the equation in 1 (Papke and Wooldridge (1996)). Papke and Wooldridge (1996) use a quasi-likelihood regression model for continuously measured proportions including 0's and 1's observations

$$l(\beta) = y_i \ln(G(x_i)) + (1 - y_i)\left[1 - \ln(G(x_i))\right]$$
$$\text{where } G(x_i) = \frac{e^{-f(x_i)}}{1 + e^{-f(x_i)}} \text{ and}$$

$$f(x_i) = \beta_0 + \beta_1 ln(Price)_i + \beta_2 Customer\ Rating_i + \beta_3 \left(Customer\ Rating_i - Mean\ Rating\right)^2$$
$$+ \beta_4 Star_i + \beta_5 \left(Star_i - Mean\ Star\right)^2 + \beta_6 ln(Size)_i + \sum_{k=1}^{N-1} \beta_{k,D} RegionDummy_i$$

In the equation above $y_i$ is the likelihood of writing review. In order to test the effect of extreme satisfaction and dissatisfaction, we added the square root of difference between quality variable and the mean value of it. In this way, U type relationship between quality variable (i.e. star and customer rating) and independent variable is captured. We predicted the parameters of independent variables using Maximum likelihood approach. Size and region dummy is added as explanatory variable for control purposes. We take the logarithmic transformation of price and size of the affect as the standard deviations of these variables are large compared to other variables.

## 4. Data

The data are from one of the biggest online hotel web booking sites: www.booking.com. After customers enter information on location, check-in and check-out dates to the website, available hotels are listed and it is possible to obtain information on hotel star, type and price of hotel rooms and average hotel customer rating in this listing. If specific hotel's website is clicked, customer can get further information on sample pictures of hotel rooms and facilities, hotel policies, number of hotel rooms and detailed guest reviews. From these websites, we gathered the information on hotel star, region of the hotel in the city, room price per night, average customer rating, number of hotel rooms, number of customer reviews and number of hotel reservation. Data are collected in 2011 and the average values of price and customer rating are computed for the final data set. We used the price of a standard double room as the room price since some hotels do not have the price information for single rooms.

Individual customer rating, is calculated in the following way. First, customers rate hotel quality in terms of hotel staff, services/facilities, cleanness of hotel room, comfort, value for money and location. The score in these dimensions can be poor, fair, good or excellent and counts for 1, 2, 3 and 4 points respectively. All these points are added and divided by 2.4 for the final individual score of hotel's customer rating. Hotel's region information is obtained based on classification of booking.com. Table I displays the descriptive statistics of the variables used in our study. Table 2 displays the correlation between the variables.

Table 1. Descriptive Statistics

| Variable | Observation | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| Likelihood to Review | 810 | 0.187503 | 0.067889 | 0.0384615 | 0.375 |
| Price | 810 | 136.3558 | 69.77797 | 36.59096 | 668.25 |
| Star | 810 | 2.887654 | 0.767685 | 1 | 5 |
| Rating | 810 | 7.509877 | 1 | 4.7 | 9.4 |
| (Rating-Mean Rating)$^2$ | 810 | 0.528321 | 1 | 0.0000256 | 7.868379 |

| (Star-Mean Star)$^2$ | 810 | 0.588685 | 0.817987 | 0.0145996 | 4.497916 |
| Room Size | 810 | 57.80864 | 77.14124 | 9 | 1025 |

Table 2. Correlation between Variables

| | Likelihood to Review | Price | Star | (Star -Mean Star)$^2$ | Rating | (Rating-Mean Rating)$^2$ | Room Size |
|---|---|---|---|---|---|---|---|
| Likelihood to Review | 1 | | | | | | |
| Price | -0.097 | 1 | | | | | |
| Sstar | -0.063 | 0.744 | 1 | | | | |
| (Star-Mean Star)$^2$ | -0.114 | 0.360 | 0.060 | 1 | | | |
| Rating | 0.079 | 0.583 | 0.481 | -0.0111 | 1 | | |
| (Rating-Mean Rating)$^2$ | -0.044 | 0.048 | -0.09 | 0.2782 | -0.319 | 1 | |
| Room Size | -0.072 | 0.220 | 0.277 | 0.1466 | 0.104 | -0.087 | 1 |

## 5. Estimation Results

Before testing the hypotheses, several econometric specifications are checked. We first identify outliers of the log transformation of price and sales per room variable in the data set using the Grubbs methodology. Grubbs' test (Grubbs (1969) and Stefansky (1972)) is used to detect one outlier at a time in the univariate data set. The outlier is removed from the data set and the test is iterated until no outliers are detected. This test is also known as the maximum normed residual test. The multicollinearity of explanatory variables is investigated using the variance inflation factor (VIF). VIF values range from 1.27 to 3.10. Since VIF values are smaller than the recommended value of 10 (Belsley, Kuh, & Welsch, 1980), we conclude that there is no multicollinearity problem in our regression analysis.

Table 3. Regression Results

| | Coefficent | Standart Deviation | z-statistics | P value |
|---|---|---|---|---|
| ln(Price) | -0,18772 | 0,083318 | -2,25 | 0,024 |
| ln(Room Size) | -0,08308 | 0,028513 | -2,91 | 0,004 |
| Rating | 0,134557 | 0,032072 | 4,2 | 0 |
| (Rating-Mean Rating)$^2$ | 0,006063 | 0,022925 | 0,26 | 0,791 |
| Star | 0,017593 | 0,03657 | 0,48 | 0,63 |
| (Star-Mean Star)$^2$ | -0,02953 | 0,02134 | -1,38 | 0,166 |

The significances of the coefficients of star and customer rating test our third (H3) and fourth (H4) hypotheses. For all of the regression specifications with different sets of explanatory variables, the coefficient of the customer rating is significant at 1% and the sign of the coefficient is positive. Thus, the regression results validate our third hypothesis (H3) by showing that an increase in the customer rating of a hotel leads to a significant increase in the propensity to write a review. Even though we are able to validate H3, we could not find supportive evidence from the regression result for the fourth hypothesis. The regression results show that the coefficient of star rating is insignificant even at the 10% significance level. Thus, the hypothesis that higher star rating result in higher propensity to write a review is not supported. In order to test U type relationship between the propensity to review and quality variables proxied by star and customer rating, we added the square of the difference between the value of these variables and their means as explanatory variables. The significances of these variable test our first (H1) and second (H2) hypotheses. However, the coefficients of these variables are not significant .Thus, we could not validate the hypotheses that extreme higher or lower customer and star rating results in higher propensity to review. The coefficients of price's log transformation

test our fifth hypothesis that lower price results in higher the propensity to review. Our results provide support for this hypothesis.

## 6. Conclusion

We seek to understand the people's motivation for writing the reviews in order to understand drivers of WOM activities in the online channel for the successful implementation of the hotel marketing. For this purpose, we choose one of the popular tourist destinations: Paris. We collect data for empirical analysis from one of the biggest online hotel reservation website. Our analysis reveal that higher rating and lower price increases the propensity to write while the extreme high or low rating and star score, star rating does not have any effect on the propensity to write a review. We have also found the evidence for the negative effect of larger room size on the propensity to write a review. These results imply that satisfaction rather than dissatisfaction affects people more for writing reviews in hotel websites.

In our paper, we test whether online customer review is subject to self selection bias meaning that customers having extreme satisfaction or dissatisfaction are more likely to post reviews compared to other past customers. Our results did not provide supportive evidence for this argument. We also show how to increase posting of online comment. This is especially more important for the hotels having fewer reviews as limited reviews are more likely to represent the biased estimate of hotel's true customer rating. Furthermore, higher online number of reviews may increases sales as it implies that people frequently prefer this hotel.

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