AN ECONOMETRIC ANALYSIS OF ONLINE RATINGS OF HOTELS IN ALBANIA

Alma Braimllari (Spaho)[1]
Enxhia Sala[2]

ABSTRACT

During the travel and tourism decision making process, the online reviews are used as an important source of information by hotel guests. The main objective of this research was to analyze the online ratings of hotels in Albania. The data from Booking.com were collected for 220 hotels with 40 or more online reviews during the period of time 4 - 6 January 2017. The results of descriptive analysis indicated that about 44% of the hotels in the sample are located in Tirana-Durrës region, 40% have 20 to 30 rooms, 48% are 3-stars hotels, and 45% had from 40 to 100 online reviews. The average of overall online rating of hotels was 8.57 and 68.2% of the hotels had an overall online rating ranging from 7 to 9. To analyze the relationships between hotels' size, hotel's category, hotel's region, the number of online reviews and the overall online rating of the hotels, two econometric models were estimated. Results of econometric models indicated that hotel's size and region negatively impact the overall online rating of the hotels, whereas the hotel's category and the number of online reviews positively impact the overall online rating.
These findings are useful for hotel guests and potential customers, and also for hotels' managers in order to increase the online ratings of their hotels and customer satisfaction. The hotels' managers should pay attention to the online reviews provided by the hotel guests and they must encourage their guests to write reviews about their hotel stay.

Keywords: *online ratings, Booking.com, hotel sector, logistic model, Tobit model, Albania*
JEL Classification: *C34, C35, C51, L83*

1. Introduction

Development in information and communication technology has recently affected the tourism sector. Tourists usually use social media to give a feedback about the experience they had. The feedback includes rating, views and comments posted online. The reviews can be checked in various websites like Booking.com, TripAdvisor, Expedia, Hotel.com, Yelp, etc. Such websites provide lots of reviews about the accommodation establishments and generate an online rating for each property based on the individual user reviews. Tourists check these websites to be informed about properties and facilities of the resorts or the hotels they are interested in. And usually these reviews, that they read online, affect the decisions they take. Even the hotels have been using their own review platform to help guests and potential customers interact with each other

[1] Associate Professor, University of Tirana, alma.spaho@unitir.edu.al
[2] MSc, University of Tirana, enxhia-03@hotmail.com

(Kasavana et al., 2010). The influence of these online review platforms has a great contribution to the tourism and hospitality industry in general (Kwok and Yu, 2013).

Two of the largest hotel review databases with global reach are Booking.com and TripAdvisor. These two systems use different approach to the hotel reviews. In TripAdvisor every person can write a review, regardless whether he stayed at the hotel or not. This fact creates the possibility for fake reviews, making this website with low credibility. On the other hand, reviews in Booking.com may be written only by guests, who have actually stayed in the reviewed hotel via a reservation through Booking.com website. Hence, Booking.com reviews and ratings should be considered as more objective and subject to less manipulation compared to reviews in TripAdvisor (Ivanov, 2014). For this reason and since the number of hotels in Booking was higher compared to TripAdvisor, in this study was selected the database of Booking.com.

The World Economic report by World Travel and Tourism Council shows that the tourism continuous to grow in spite of continuous economic competitiveness. In Albania, the direct contribution of Travel & Tourism to GDP in 2015 was ALL 87.6 billion (6.0% of GDP) and is forecast to rise by 5.7% to ALL 92.6 billion in 2016. This primarily reflects the economic activity generated by industries such as hotels, travel agents, airlines and other passenger transportation services (excluding commuter services). But it also includes, for example, the activities of the restaurant and leisure industries directly supported. The total contribution of Travel & Tourism to GDP (including wider effects from investment, the supply chain and induced income impacts) for Albania was ALL 306.2 billion in 2015 (21.1% of GDP) and is expected to grow by 5.4% to ALL 322.7 billion (21.5% of GDP) in 2016. Travel & Tourism generated 51,000 jobs directly in 2015 (5.5% of total employment) and this is forecast to grow by 3.4% in 2016 to 53,000 (5.6% of total employment). The total contribution of Travel & Tourism to employment (including wider effects from investment, the supply chain and induced income impacts) was 180,000 jobs in 2015 (19.3% of total employment). This is forecast to rise by 3.1% in 2016 to 185,500 jobs (19.7% of total employment) (World Travel and Tourism Councill, 2016).

The hotel industry assumes an important value in the tourism industry because it is essential for the provision of all other tourism services and it is the first service demanded by tourists who reach the destination (Orfila-Sintes et al, 2005). Moreover, the hotel industry carries a high weight in the totality of tourist expenditure (Santoro, 2015). For these two reasons, this research focuses on the hotel industry within the tourism sector in Albania.

The aim of this study was to analyze the online ratings of hotels in Albania using database of Booking.com. Two econometrics models are used to evaluate the influence of hotel's size, region, category and the number of online reviews on the overall online rating of hotels in Albania. The findings of this research are useful for potential customers, guests and hotels' managers.

2. Literature review

Web-based content research using customer reviews, opinions and comments has become widespread over the last decade. The opinions of customers about hotels, travel destination and travel services have recently been recorded in the form of the online customer reviewers. The online reviewers are used by customers as an important source in travel and tourism decision making process (Ye et al. 2011). Exchange of information using social media is important, as

customers rely on online reviewers of other customers on the decision making process. Consumers tend to rely on easy-to-process information, when evaluating a hotel based upon reviews (Sparks and Browning, 2011).

Research has shown that potential customers tend to trust written comments posted online by other customers more than recommendations found on official destination marketing or hotel websites (Sparks, Perkins, & Buckley, 2013). According to Santoro (2015) competition between tourist destinations is affected by quality offered by hotels in the region, and for this reason, to add value to the hotel and to the region is necessary providing quality services and to pay attention to the customer needs and customer satisfaction. In their study, Iliera and Ivanov (2014) found that hotel's size and category negatively influence its online rating, whereas the number of online reviewers has a positive influence on online rating. Using the data collected from online hotel review websites, Rajaguru and Rajesh (2016) found that the hotel managers should pay attention to online reviewers provided by the customers and make sure that the customers receive value for money they spend as value for money significantly contribute to the customers' overall satisfaction. Also service quality impacts the customer satisfaction. The results of Kim and Park (2017) indicate that social media review rating is a more significant predictor than traditional customer satisfaction for explaining hotel performance.

3. Research Methodology

The target population of this study consists of hotels operating in Albania with 40 or more online reviews. The sample is comprised by 220 hotels. The data from Booking.com are collected from 4 January to 6 January 2017. Information about online revierwers' score for cleanliness, comfort, location, facilities, staff, value for money, Free Wi-Fi, and overall online rating; information about the number of stars, number of rooms of the hotel and the time since the Booking.com has wellcomed the hotel are gathered.

To analyze the relationships between hotels' characteristics and the overall online hotel rating, a binary logistic regression and a Tobit regression model were estimated.

A logistic regression model with a binary response was modeled. Logistic regression is recommended over linear regression when modeling binary responses and allows the researcher to estimate probabilities of the response occurring (Hosmer et al, 2013). The logistic regression equation takes the following form

$$\ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_k x_k \qquad (1)$$

where p is the estimated probability that a hotel to have an overall online rating ranging from 9 to 10, and x_1, x_2, ..., $x_k$are independent or explanatory variables of the model.

The estimated probability of the response occurring (p) divided by the probability of it not occurring (1-p) is called the odds ratio (OR). Maximum likelihood method is used to estimate the odds ratios of the model. Values of odds ratios higher than 1 indicate positive association between the variables, odds ratios equal to 1 indicate no association, while odds ratios lower than 1 indicate negative association between each independent variable and the dependent variable of the model.

Tobit regression model was also used to identify the determinants of overall online rating of hotels in Albania. Since online reviewers score was bounded, it is appropriate to use a limited dependent variable approach. The Tobit regression model is an alternative to ordinary least

squares regression and is employed when the dependent variable is bounded from below or above or both with positive probability pileup at the interval ends, either by being censored or by being corner solution (Wooldridge, 2002). The possible determinants of the overall online rating are investigated using a random effect Tobit model. A random effects model assumed that the unobservable effects are uncorrelated with the observed explanatory variables, whereas a fixed effect model assumes that they are correlated.

The two-limit Tobit model is given as:

$$y_i^* = \beta_0 + \beta_1 x_{i1} + \ldots + \beta_k x_{ik} + \varepsilon_i \quad (2)$$

$$y_i = \begin{cases} y_i^* & 0 \le y_i^* \le 1 \\ 0 & y_i^* < 0 \\ 1 & y_i^* > 1 \end{cases} \quad (3)$$

where $\varepsilon_i \sim N(0, \sigma^2)$, $x_1, x_2, \ldots, x_k$ are explanatory variables and β are unknown parameters. The variable y_i^* is a latent variable and y_i is the dependent variable, the overall online rating of the hotels. The maximum likelihood method is used to find β and σ based on values of variables y_i and x_i for *n* observations (hotels).

STATA12 was used to conduct the data analysis.

4. Results and discussion

About 44% (96) of the hotels in the sample are located in Tirana-Durrës region, and other hotels in Saranda (39), Vlora (16), Shkodër (13), Berat (12), Gjirokastër (9). Nearly 40% of the hotels have 20 to 30 rooms, and around 48% of them are 3-stars hotels. Also 45% of the hotels had from 40 to 100 online reviews and 47.73% of the hotels have been welcomed by Booking.com during the period 2013-2014 (Table 1).

Table 1. Descriptive statistics for hotels' characteristics

Variable	Frequency	Percentage
Size (number of rooms)		
Less than 10 rooms	34	15.45
20 – 30 rooms	89	40.45
30 – 50 rooms	49	22.27
50 room or more	48	21.82
Category (number of stars)		
5	8	3.64
4	75	34.09
3	105	47.73
2	3	1.36
Unrated	29	13.18
Region		
Tirana-Durrës	96	43.64
Other	124	56.36
Number of online reviews		
40-100	99	45
100-250	88	40

> 250	33	15
Starting Year in Booking.com		
2011-2012	57	25.91
2013-2014	105	47.73
2015-2016	58	26.36
Total	220	100

Among online reviewers of hotels in Tirana-Durrës region (17378 reviewers), almost 56% of them have scored 9 to 10 and 33.6% have scored 7 to 9. Whereas among online reviewers of other hotels (15835 reviewers), 54% have scored 9-10 and about 33% have scored 7 to 9 (fig.1).

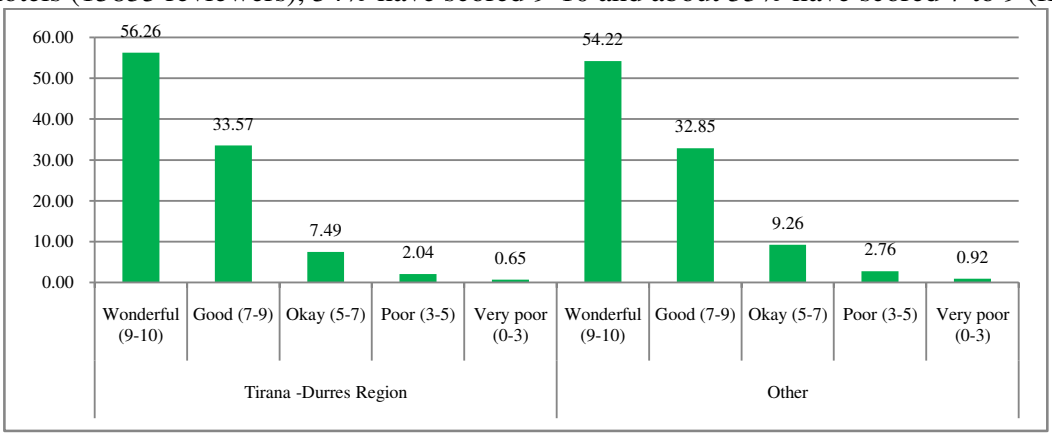

Fig. 1. Percentage of online reviewers according to their score about hotels by the region

Among online reviewers of hotels in Tirana-Durrës region, roughly 32% of them were couples, 23.5% solo travelers and 18.6% business travelers. While among online reviewers of hotels in other part of Albania, about 52% were couples, 20% were families and 16.5% were group of friends (fig. 2).

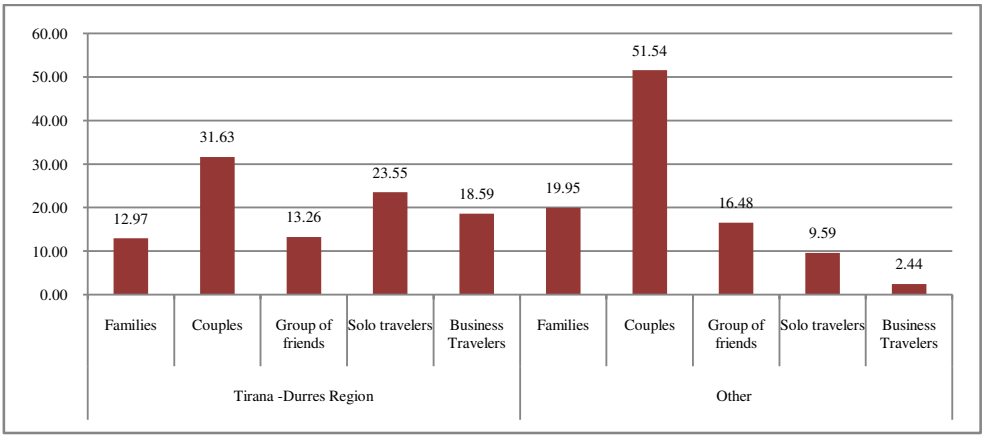

Fig. 2. Percentage of online reviewers according to type and region

The Booking.com evaluates the online ratings of hotels using 7 dimensions of performance: cleanliness, comfort, location, facilities, staff, value for money and Free Wi-Fi. Booking's online scoring allows customers to award quantitative scores ranging from 0 to 10. The average overall online rating for hotels in the sample was 8.57 with standard deviation of 0.73. In addition, 29% of the hotels had overall online rating ranging from 9 to 10 (wonderful) and 68.2% of the hotels had overall online rating from 7 to 9 (good). For hotels in Tirana–Durrës region, the average overall online rating was 8.64 and standard deviation was 0.70, while for other hotels the average was 8.51 and standard deviation 0.75.

The location had the highest score for 35% of the hotels in the sample, and for 35% of hotels the staff had the highest score. For 33.6% of the hotels the second highest reviewers score was cleanliness and for 26.4% was the staff. For 25% of the hotels, the third highest score was cleanliness and for 23.6% of the hotels was the value for money (fig. 3).

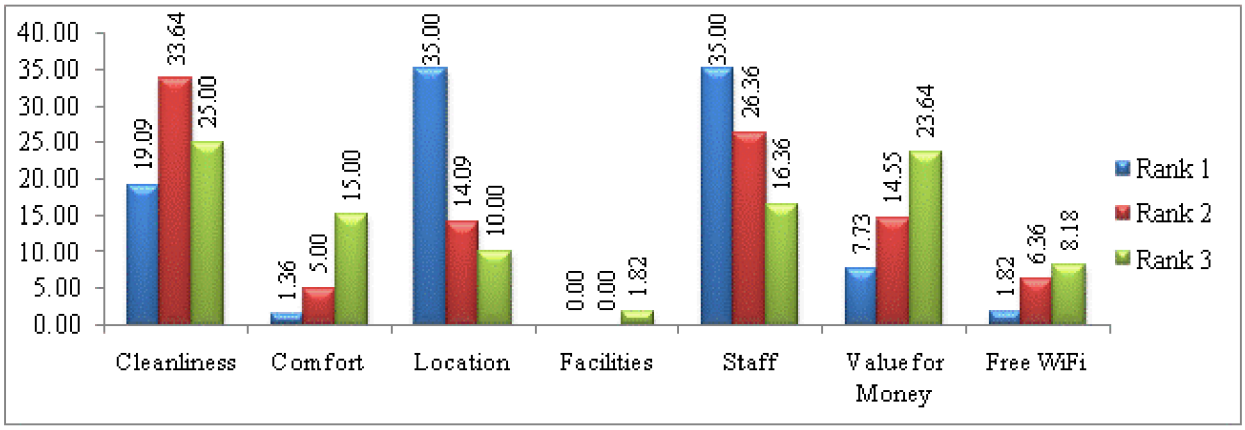

Fig 3. Percentage of hotels according to the online reviewers score

The correlation coefficients in table 2 indicated that the overall online rating was positively and significantly correlated with all the dimensions of hotels performance at 5% level.

Table 2. The correlation matrix between the dimensions of performance

	Overall	Cleanliness	Comfort	Location	Facilities	Staff	Value for money	Free Wi-Fi
Overall	1.000							
Cleanliness	0.955*	1.000						
Comfort	0.947*	0.935*	1.000					
Location	0.690*	0.581*	0.543*	1.000				
Facilities	0.957*	0.931*	0.962*	0.534*	1.000			
Staff	0.889*	0.824*	0.787*	0.498*	0.841*	1.000		
Value for money	0.914*	0.837*	0.843*	0.525*	0.864*	0.853*	1.000	
Free Wi-Fi	0.773*	0.723*	0.709*	0.484*	0.750*	0.756*	0.738*	1.000

Note: * $p < 0.5$

The results of analysis of variance indicated statistically significant differences at 5% level between hotel online ratings and hotel's size, and also between hotel online reviewers'

scores and the number of online reviews. Moreover, statistically significant differences were found between staff score and the hotel region, between Free Wi-Fi score and the hotel region, and between value for money score and the hotel category.

The results of table 3 showed that overall online rating was negatively correlated with hotel size and region, and positively correlated with hotel category and the number of online reviews at 5% level.

Table 3. Correlation matrix between overall online rating and hotel's characteristics

	Overall	**Size**	**Region**	**Category**	**Reviews**
Overall	1.000				
Size	-0.317*	1.000			
Region	-0.085*	-0.197*	1.000		
Category	0.016*	0.423*	-0.147*	1.000	
Reviews	0.182*	0.104*	-0.189*	0.064*	1.000

Note: * $p < 0.5$

To estimate a binary logistic regression model, the dependent variable with binary response was used. A hotel was considered with top performance if its overall online reviewers score was from 9 to 10. The results of three binary logistic regression models are shown in table 4. The results of model 3 indicated that the model was statistically significant (LR chi-square (5) = 34.7, $p < 0.01$). The value of Pseudo-R^2 was 12.3% and the percentage of cases correctly classified was 71.82%. The classification accuracy should be at least 25% greater than that achieved by chance (Hair et al., 2009).

The results of model 3 indicated that the overall online rating was statistically significant and negatively related to the hotel's size at 1 % level, that is, the hotels with 30 or more rooms were less likely to score 9 to 10 by online reviewers. Also, region of the hotels influenced negatively the overall online rating at 10% level, that is, the hotels in Tirana-Durrës region were more likely to score 9 to 10 by online reviewers. The overall online rating was positively related to the hotel's star category and the number of online reviews at 1% level. This means that hotels with 4 or 5 stars and hotels with 250 or more online reviews were more likely to have an overall online rating from 9 to 10.

Table 4. Results of Binary Logistic Regressions

Variable	**Model 1**		**Model 2**		**Model 3**	
	Coef.	OR	Coef.	OR	Coef.	OR
Size: *Less than 30 rooms*		1.000		1.000		1.000
30 rooms or more	-0.857	0.424**	-1.034	0.356**	-1.672	0.188**
Region: *Tiranë-Durrës*				1.000		1.000
Other			-0.749	0.473*	-0.612	0.542+
Category: *4 to 5 stars*						3.502**
3 or 2 stars or unrated					1.253	1.000
Number of reviews:						
40 to 100						1.000
100 to 250					0.067	1.069
250 or more					1.152	3.163**
Constant	-0.311	0.732+	0.168	1.183	-0.360	0.698

LR chi-square (df)	8.49(1)**	14.63(2)**	34.70(5)**
% correctly classified	66%	65.5%	71.82%
Pseudo-R^2	3.0%	5.2%	12.3%

Note: + p < 0.10 * p < 0.5, ** p < 0.01.

The robustness of the hotel's characteristics that influence overall online rating was checked by estimating a Tobit regression model. The results of three Tobit models are shown in table 5.

Table 5. The results of Tobit models

Variable	Model 1	Model 2	Model 3
Size	-0.465**	-0.509**	-0.615**
Region		-0.225*	-0.162+
Category			0.245*
Number of reviews 40 to 100 100 to 250 250 or more			 0.103 0.453**
Constant	8.77**	8.921**	8.730**
Sigma	0.690	0.681	0.655
LR chi-square (df) **Pseudo-R2**	23.33(1)** 4.82%	28.95(2)** 6%	46.34(5)** 9.6%

Note: + p < 0.10 * p < 0.5, ** p < 0.01.

The results of Tobit model 3 indicated that the model was statistically significant (LR chi-square (5) = 46.34, p < 0.01). The value of Pseudo-R^2 was 9.6%. The results of model 3 showed that the hotel's size and region have negative effect on overall online rating, whereas hotel's star category and the number of online reviews has positive effect on overall online rating.

The results of two econometric models were consistent with the findings of Iliera and Ivanov (2014). Iliera and Ivanov (2014) found that hotel's size and category negatively influence its online rating, whereas the number of online reviewers has a positive influence on online rating.

5. Conclusions and future research

The goal of this research was to analyze the online ratings of 220 hotels operating in Albania. The results of descriptive analysis indicated that the average overall online rating for the hotels in the sample was 8.57. About 68.2% of the hotels had overall online rating from 7 to 9 and 29% of the hotels had overall online rating ranging from 9 to 10. Almost 55.3% of online reviewers of Booking.com have scored from 9 to 10 and 33.6% have scored from 7 to 9. This indicated that 55% of online reviewers awarded scores that reflect very good experiences during their hotel stays in Albania.

The results of econometric models indicated that hotel's size and region negatively influence the overall online rating of the hotels in Albania, whereas the hotel's star category and number of online reviews positively influence the overall online rating. More specifically, hotels with less than 30 rooms, hotels located in Tirana–Durrës region, hotels with 4 or 5 stars and

hotels with 250 or more online reviews were more likely to score from 9 to 10 by online reviewers.

The results of this research suggest that the hotels' managers should pay attention to the online reviews provided by the hotel guests. The hotels' managers must encourage their guests to write reviews about their stay since the number of online reviews was positively related to the overall online rating of the hotels in the Booking.com. The findings of this study can be used by potential customers, hotel guests, and by hotels' managers to make decisions regarding their marketing budget allocation.

In the future research, the comparison of overall online ratings of hotels in Albania by different websites (Booking.com, TripAdvisor, Expedia, Hotel.com, Yelp, etc), and also the comparison of overall online rating of hotels in Albania with overall online ratings of hotels in other Balkan countries such as Montenegro, Macedonia FYR and Kosovo can be conducted.

References

1. Hair J.F., Black W., Babin B.J., & Anderson R.E., (2009): *Multivariate Data Analysis*. 7th ed.
2. Hosmer Jr, D. W., Lemeshow, S., & Sturdivant, R. X. (2013). *Applied logistic regression*. 3d ed.
3. Ilieva, D., & Ivanov, S. H. (2014). *Analysis of online hotel ratings: the case of Bansko*, *Bulgaria*.
4. Ivanov, S. H. (2014). *Hotel revenue management: From theory to practice*. Varna: Zangador.
5. Kasavana, M. L., Nusair, K., & Teodosic, K. (2010). Online social networking: redefining the human web. *Journal of Hospitality and Tourism Technology*, *1*(1), 68-82.
6. Kim, W. G., Kim, W. G., Park, S. A., & Park, S. A. (2017). Social media review rating versus traditional customer satisfaction: Which one has more incremental predictive power in explaining hotel performance?. *International Journal of Contemporary Hospitality Management*, *29*(2), 784-802.
7. Kwok, L., & Yu, B. (2013). Spreading social media messages on Facebook: An analysis of restaurant business-to-consumer communications. *Cornell Hospitality Quarterly*, *54*(1), 84-94.
8. Orfila-Sintes, F., Crespí-Cladera, R., & Martínez-Ros, E. (2005). Innovation activity in the hotel industry: Evidence from Balearic Islands. *Tourism Management*, *26*(6), 851-865.
9. Rajaguru, R., & Rajesh, G. (2016). Value for Money and Service Quality in Customer Satisfaction. *The Social Sciences*, *11*(19), 4613-4616.
10. Santoro, G. (2015) Evaluating performance in the hotel industry: An empirical analysis of Piedmont. *Journal of Investment and Management*, 4(1-1): 17-22.
11. Sparks, B. A., Perkins, H. E., & Buckley, R. (2013). Online travel reviews as persuasive communication: The effects of content type, source, and certification logos on consumer behavior. *Tourism Management*, *39*, 1-9.
12. Sparks, B.A. and Browning, V. (2011) The impact of online reviewers on hotel booking intentions and perception of trust. *Tourism Management*, 32: 1310-1323.
13. Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. MIT press.
14. World Travel and Tourism Councill (2016). *World Economic Impact Report 2016*, Albania. Retrived from www.wttc.org .
15. Ye, Q., Law, R., Gu, B., & Chen, W. (2011). The influence of user-generated content on traveler behavior: An empirical investigation on the effects of e-word-of-mouth to hotel online bookings. *Computers in Human Behavior*, 27(2), 634-639.