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Understanding antecedents of TripAdvisor's GreenLeader participation

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Introduction

Green practices, generally defined as "business activities aimed at reducing negative impacts on the environment", have evolved and grown into a significant and popular research subject in the tourism and hospitality industry (Kim, Lee, & Fairhurst, 2017). A conjoint analysis revealed that the most influential and single environmentally friendly attribute for a sample of 571 business and leisure travelers was green hotel certification (Millar & Baloglu, 2011). There is no doubt that a green certification may present itself as an authorized recognition of green practices; however, the large number and a diverse body of green certification can be confusing for stakeholders and travelers (Pizam, 2009).

Past studies recommend the hospitality industry to establish its own reporting and certification standards for green practices and to encourage active participation from hotel businesses (Kim et al., 2017). To facilitate and simplify travelers' search online, TripAdvisor officially launched the "TripAdvisor GreenLeader" program on April 22, 2013, partnering with top environmental and green programs, including U.S. Environmental Protection Agency's Energy Star program, the U.S. Green Building Council (USGBC), and the United Nations Environment Programme (UNEP, 2013). The TripAdvisor GreenLeader program offers information that assist environmentally-conscious or "green" travelers to make reservation based on their environmental preferences. TripAdvisor extended the GreenLeader program into 19 markets in Europe in 2014, after success in the U.S. with over 3,700 accommodations awarded the GreenLeader status (TripAdvisor, 2014). By the end of 2017, over 4,000 hotels and B&Bs participated in this program (TripAdvisor, 2017). This green program not only helps the participating business "impress travelers with the highly-respected program", "get special recognition in reviews", but ultimately "give travelers another reason to feel good" about their purchase, which in turn enhances customers' satisfaction (TripAdvisor, 2017).

Based on a holistic evaluation of the green and eco-friendly practices, such as towel and linen reuse, recycling and composting food or yard waste, energy-efficient lightbulbs, education and training on green practices, participating hotels are ranked on four levels – Bronze, Silver, Gold and Platinum. A higher TripAdvisor GreenLeaders level indicates more application of green practices in the hotel. Besides the four recognized levels, a TripAdvisor GreenPartner status is awarded to hotels that have at least seven green practices. The seven required green practices include energy tracking on a regular basis (at least quarterly), towel reuse, linen reuse, recycling, staff training on understanding and implementing green practices, information for guests on green practices, and energy-efficient light bulbs (at least 75% of the interior light bulbs).

The green concept and management have also been well-recognized strategies to promote a hotel's competitive advantage. Some major international hotel chains start to commit to sustainability and integrate sustainability into their core business strategy (Jones, Hillier, & Comfort, 2014). The findings from a study on green hotel image confirm the positive influence of a green hotel's image on favorable behavioral intentions, such as the intention to revisit, intention to offer positive recommendations to others, and willingness to pay a premium (Lee, Hsu, Han, & Kim, 2010). There is a surge of publications when TripAdvisor released online reviews collected for the top 10 green hotels in 2014 (Yi, Li, & Jai, 2016). However, it is not clear whether the GreenLeader status and levels are effective labeling and marketing strategy to differentiate and distinguish hotels and

how they are related to other hotel features. The lack of empirical studies on the influencing factors for the GreenLeader status and levels makes it hard to understand how the recognition of the green program may play a role in the hotel business, as related to other features and attributes of a hotel.

In line with the resource-based theory (RBT) and the stakeholder perspective, this research aims to investigate how the hotel-related variables, such as service excellence, travelers' origins, online reputation and popularity, and other important hotel attributes such as location, size, type, and price, may influence on the status and levels of the GreenLeader program. With a sample of hotels worldwide, the study contributes to the current knowledge of sustainable tourism and business social responsibility by providing a comprehensive analysis on factors facilitating/inhabiting GreenLeader program participation.

Literature Review

RBT analyses a firm as "a collection of resources" to explain and predict "sustained superior firm performance (Barney, 1986, 1991). The generation of a sustainable competitive advantage relies on the four key attributes of a firm resource, including value, rarity, inimitability and substitutability (Barney, 1995). There are many applications of the RBT model in the hospitality literature. For example, researchers argued that large companies, in possession of more financial and informational resources, are able to invest and to obtain knowledge and information that support green practices (Leonidou, Leonidou, Fotiadis, & Zeriti, 2013). Based on the natural resource-based view, an empirical study affirmed the direct relationship between green training and environmental performance in the hospitality industry (Cabral & Chiappetta Jabbour, 2020). The essence of stakeholder theory is the belief that businesses should be responsive and sensitive to the interests and concerns of stakeholders, including customers and society at large, to achieve long-term business success (Jones et al., 2014). The concept of sustainability is closely related to stakeholder concept (Wheeler, Colbert, & Freeman, 2003).

Research Method

We developed a JAVA program to crawl the hotel-specific information from the TripAdvisor website. The information includes hotel location (latitude and longitude), hotel amenities and facilities, hotel online performance indicators (Traveler Choice award, online review rating volume and valence), hotel size, number of rooms, average room rate, review language, and GreenLeader award. As the GreenLader program is not available in all countries, we collected the data from 28 countries. For each country, we crawled the data from the top 20 destinations on its TripAdvisor page, and specifically for the United States, we collected the data from the top 40 destinations. Because many guest houses and bed and breakfast properties are also listed on TripAdvisor, we kept properties with a minimum size of 10 rooms in the sample. Furthermore, we dropped destinations without any GreenLeader hotels. After all these steps, we obtained a total of 43,312 hotels from 328 destinations across the world. Figure 1 presents the location of destinations and the sample size of hotels in each destination. Note that the GreenLeader program is only available in some regions of the world.

Figure 1. Location of sampled destinations

We chose binary and ordered logit models to examine hotels' participation in the GreenLeader program. In the binary logit model, the dependent variable, green, measures the participation (green = 1 for hotels with GreenLeader award, and green = 0; otherwise). In the ordered logit model, the dependent variable, green_rank, measures the rank of GreenLeader award such that green_rank = 1 for GreenLeader Partners, green_rank = 2 for GreenLeader Bronze award, green_rank = 3 for GreenLeader Silver award, green_rank = 4 for GreenLeader Gold award, and green_rank = 5 for GreenLeader Platinum award. For independent variables, we specify the following variables:

- traveler_choice: a categorical variable indicating the award of Traveler Choice on TripAdvisor: traveler_choice = 1 for hotels awarded Traveler's Choice, traveler_choice = 2 for hotels awarded 2020 Travelers' Choice Best of the Best, and traveler_choice = 0; otherwise. This variable measures the service excellence of hotels.

- lntotal_lang: the log of the number of review languages used in hotel reviews. This variable measures the level of internationalization of hotel demand.

- dominant_lang_perc: the percentage of reviews using the most popular review language of the hotel. This measures the level of geographical concentration of hotel demand.

- lnreviews: the log of the number of hotel reviews on TripAdvisor. This variable captures the online popularity of the hotel.

- rating: the TripAdvisor rating out of five. This variable proxies the online reputation of the hotel.

- lnrestaurants: the log of restaurants within 0.3 miles of the hotel. This variable reflects the urbanization economies of the hotel's location.

- lnrooms: the log of hotel rooms. This variable measures hotel size.

- lnprice_average: the log of average room rate reported on TripAdvisor. This variable reflects hotel class.

- business_hotel: an indicator of the business hotel as described on TripAdvisor: business_hotel = 1 for business hotels, and business_hotel = 0, otherwise.

- family_hotel: an indicator of the family hotel as described on TripAdvisor: family_hotel = 1 for family hotels, and family_hotel = 0, otherwise.

- central_location: an indicator of central location as described on TripAdvisor: central_location = 1 for hotels in central location of the destination, and central_location = 0, otherwise.

To estimate the model, we had to control the destination-specific effects to alleviate the potential omitted variable biases in econometric modeling (Greene, 2007). Therefore, we estimated the fixed-effects binary/ordered logit model by incorporating destination-specific dummies and the random-effects one by using the mixed-effects model (Yang, Wu, & Yang, 2018). Table 1 further presents the descriptive statistics of variables.

Table 1. Descriptive statistics of variables

Variables	All sample (N = 43,312)		GreenLeader sample (N=2,814)	
	Frequency	Percent	Frequency	Percent
green = 0	40,498	93.5		
green = 1	2,814	6.5		
green_rank = 1			705	25.05
green_rank = 2			661	23.49
green_rank = 3			770	27.36
green_rank = 4			465	16.52
green_rank = 5			213	7.57
traveler_choice = 0	28,343	65.44	1,066	37.88
traveler_choice = 1	14,148	32.67	1,628	57.85
traveler_choice = 2	821	1.9	120	4.26
	Mean	Std. Dev.	Mean	Std. Dev.
lntotal_lang	1.979	0.743	2.409	0.563
dominant_lang_perc	0.675	0.218	0.736	0.205
lnreviews	5.379	1.642	7.042	1.124
rating	3.934	0.647	4.176	0.379
lnrestaurants	4.399	1.042	4.457	1.019
lnrooms	3.886	1.057	4.993	1.026
lnprice_average	4.772	0.683	5.205	0.575
business_hotel	0.082	0.274	0.169	0.375
family_hotel	0.133	0.339	0.144	0.351
central_location	0.172	0.378	0.161	0.368

Empirical Results

Table 2 presents the estimation results. First, we estimated the binary logit model of GreenLeader award using a sample of 43,312 hotels. Model 1 presents the results from the fixed-effects model whereas Model 2 presents the results from the mixed-effects model. Both models provide largely similar findings on the significance and sign of most estimated coefficients. First, online performance indicators, such as lnreviews and rating, were found to be positively associated with GreenLeader participation. Also, the location of the hotel matter. The results suggest that hotels in a central location (central_location) and neighborhoods with more restaurants (lnrestaurants) are less likely to participate GreenLeader program. Furthermore, hotel size and hotel class explain GreenLeader participation, with larger hotels (lnrooms) and high-class hotels (lnprice_average) being more likely to become GreenLeader. Lastly, the results show that the hotel demand segment shapes this decision: while business hotels (business_hotel) are more enthusiastic about joining the program, family hotels (family_hotel) are more reluctant in doing so.

Table 2. Estimation results of binary and ordered logit models

Variables	Model 1	Model 2	Model 3	Model 4
	green	green	green_rank	green_rank
	Fixed-effects	Mixed-effects	Fixed-effects	Mixed-effects
traveler_choice = 1	-0.00146	-0.00516	0.239**	0.256***
	(0.060)	(0.069)	(0.102)	(0.096)
traveler_choice = 2	-0.204	-0.198	0.758***	1.065***
	(0.136)	(0.154)	(0.253)	(0.220)
lntotal_lang	-0.0306	-0.00837	-0.341*	-0.350**
	(0.093)	(0.106)	(0.175)	(0.148)
dominant_lang_perc	0.0550	-0.0274	0.362	-0.710**
	(0.234)	(0.276)	(0.428)	(0.352)
lnreviews	0.706***	0.667***	0.440***	0.456***
	(0.039)	(0.054)	(0.078)	(0.073)
rating	0.734***	0.735***	0.508***	0.590***
	(0.064)	(0.079)	(0.146)	(0.144)
lnresteraunts	-0.0897***	-0.0901***	-0.0157	-0.0887**
	(0.029)	(0.030)	(0.052)	(0.042)
lnrooms	0.561***	0.552***	-0.180***	-0.221***
	(0.034)	(0.046)	(0.066)	(0.063)
lnprice_average	0.0977*	0.106*	-0.117	-0.186*
	(0.057)	(0.063)	(0.119)	(0.105)
business_hotel	0.175***	0.203***	0.0698	-0.0314
	(0.064)	(0.069)	(0.111)	(0.107)
family_hotel	-0.178***	-0.180***	0.0346	0.0103
	(0.066)	(0.064)	(0.110)	(0.093)
central_location	-0.190***	-0.161**	0.0624	-0.00611
	(0.064)	(0.063)	(0.109)	(0.107)
constant	-12.81***	-12.25***		

	(1.052)	(0.443)		
cut off 1			0.690	0.673
			(0.732)	(0.738)
cut off 2			1.990***	1.879**
			(0.733)	(0.732)
cut off 3			3.534***	3.287***
			(0.735)	(0.727)
cut off 4			5.266***	4.810***
			(0.740)	(0.738)
N	43312	43312	2814	2814
N (destinations)	328	328	328	328
AIC	15365.6	15433.8	8132.9	8238.8
BIC	18315.5	15555.2	9862.1	8345.7

Notes: (1) *,**,*** indicate significance at the 10%, 5%, and 1% level, respectively. (2) Robust standard errors are presented in parentheses.

Models 3 and 4 estimated the ordered logit model of green_rank based on a sample of GreenLeader hotels (N = 2,814). There are some minor discrepancies between the fixed-effects (Model 3) and mixed-effects (Model 4) models. As the fixed-effects model holds less restrictive assumptions on the destination-effect and is expected to provide more robust results, we explain the results based on Model 3. According to the estimation results, hotels with better online performance indicators, such as Traveler Choice award (traveler_choice), larger online rating volume (lnreviews) and higher valence (rating), are more likely to award a higher-ranked GreenLeader title. Other than these, only demand internationalization (lntotal_lang) and hotel size (lnrooms) were estimated to be significant. Hotels with a lower level of demand internationalization and small size are more likely to award a higher-ranked GreenLeader title. Interestingly, although hotel location, demand segmentation, and hotel class help explain the participation of the GreenLeader program, they were not determinants of GreenLeader rank. Moreover, the coefficient of lnrooms flipped the sign in Models 3 and 4. While larger hotels are more likely to become GreenLeader, they are less likely to obtain a higher-ranked GreenLeader title.

Conclusion and Discussion

Based on a sample of 43,312 hotels from 328 destinations in 28 countries, we empirically examined antecedents of TripAdvisor's GreenLeader participation. Our binary logit model indicates that hotels with better online reputations, larger size, lower level of urbanization economies, and higher reliance on business travelers are more likely to join the GreenLeader program. For GreenLeader hotels, online reputation factors and hotel size also explain their ranks. Our results improve the understanding of social responsibility behavior at the individual business level. Furthermore, the results provide vital insights on Green program designing and promotion to involve a large body of hotel participants.

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