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Moderating the impact of e-commerce expenses on financial performance in US upper upscale hotels: The role of property size

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Abstract

The heavily fragmented hotel industry, embracing the changes in their guests' use of electronic devices, has spent considerable resources to incorporate electronic commerce (e-commerce) practices. The extant literature offers inconclusive findings with regard to the effect of e-commerce on firm performance, especially when firm size is considered. Given the high fragmentation of size in the hotel industry, understanding its role in the deployment of e-commerce could result in substantial benefits for both hotel firms and consumers. Using the financial performance of 689 observations of over 110 hotels during 2007–2012, this study finds that e-commerce expenses positively impact firm performance, and that firm size moderates the relationship between e-commerce expenses and firm performance.

Keywords

e-commerce, economies of scale, financial performance, hotel performance, marketing expenses

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Introduction

Today's increasingly technology-savvy hotel guests travel with various technologies, such as smart watches, mobile phones, tablets, and laptops, and they use them to pre-check into their hotel rooms, browse the Internet, work, and, most importantly, purchase hotel products, services, and amenities during their stays (Gaffney, 2014). In response to such behaviors, the hotel industry has invested in information technology (IT) (Nyheim and Connolly, 2012), by digitizing many enterprise tasks and processes that improve the efficiency and optimize resource deployment (Amaro and Duarte, 2015). Complementarily, the consumer-facing processes have also become more intensively IT driven, radically changing the hotel industry's full value chains (Morosan and Jeong, 2008). Such value chains have been permanently altered as a result of the newly created IT links between various levels of commerce, such as hotel own storefront websites, central reservation systems, global distribution systems, to online travel agencies (OTA) (Freed, 2013). Specifically, many hotels integrated IT into their traditional commercial and marketing functions, eventually developing robust electronic commerce (e-commerce) platforms (Beldona et al., 2004). Most hotels began with a storefront website, which integrates an array of corresponding business processes, aiming to persuade guests who visit the website to eventually search for and book hotel stays (Toh et al., 2011). Supporting the general marketing function of the firm, thus categorized as marketing expenses, e-commerce expenses were deployed based on an overall assumption that they would lead to valuable outcomes for the organizations (Law et al., 2010; Lee, 2013). As defined by the Uniform Systems of Account for the Lodging Industry, e-commerce expense includes not just the website development cost but also maintenance, website registration fees, link costs, and the cost of producing a virtual tour (Hotel Association of New York City, 2006). Thus, hotel websites represent the outcome of hotels' comprehensive marketing efforts and serve as the main portals to the world of potential guests.

While the marketing–finance interface was suggested as a viable research agenda (Jang et al., 2013), so far, studies ascertaining the impact of individual types of marketing expenses on firms' financial performance are sporadic. For example, several authors have examined the relationships between certain functional area expenses and performance (e.g. e-commerce and individual marketing expenses, Hua et al., 2015; marketing, O'Neill et al., 2008; customer relationship management (CRM), Josiassen et al., 2012, 2014; and service quality, Chiu and Chen, 2014). Others assessed how pricing strategies in online channels influenced firm performance and service quality (e.g. Kim et al., 2014; Roper Garcia, 2013). However, the literature has not provided a clear understanding of how e-commerce expenses influence the financial performance of hotels, thus marking a major literature gap.

More importantly, the innate fragmentation of the hotel industry makes the generalization of any e-commerce relationship with financial performance challenging. Specifically, the industry recognizes seven chain scales, which are commonly used to categorize the hotel chains, and within each chain scale, the number of rooms of each hotel property varies greatly. While several industry characteristics that can provide explanations of the relationship between e-commerce and financial performance have been incorporated within the array of marketing expenses of the firm (e.g. scale, type of service, brand affiliation), there are characteristics of hotel properties (e.g. size, location) that could explain more accurately the circumstances in which the effect of e-commerce on financial performance occurs. Among such characteristics, property size is arguably the most important, as it can reflect the specific managerial environment, culture, and climate of a hotel property, such as employee dynamics, flows of capital, and market agility (Hambrick et al., 2005).

Outside hospitality, the literature accumulated contradictory findings regarding the role of firm size in influencing the relationship between e-commerce (and other marketing expenses) and financial performance. For example, while Chae et al. (2014) generally assumed that the impact of e-commerce expenses on firm performance is monotonic and independent of firm size, others (e.g. Chen and Hambrick, 1995; Donaldson, 2001; Hambrick et al., 2005; Van de Ven and Jeurissen, 2005) suggested that the impact of e-commerce expenses depends on firm size due to economies of scale and scope. While in the hotel industry, plausible explanations vis-à-vis the role of hotel size within the financial performance picture of a hotel can be conceptualized through the prism of concepts such as economies of scale and economies of scope, to date, no academic literature has examined the role of hotel size within the context of the relationship between e-commerce (and other marketing) expenses and financial performance. Therefore, to clarify a critical area of the literature characterized by research lacunae and academic dissent, this study examines the role of size as a potential contributor to the relationship between e-commerce expenses and financial performance in the hotel industry, specifically in the context of upper upscale hotels in the United States. To this end, this study follows two specific objectives: (1) to ascertain the impact of e-commerce expenses on financial performance of upper upscale hotels (measured in terms of both rooms revenue and gross operating profit (GOP)) and (2) to determine whether hotel size has a significant moderating effect on the relationship between e-commerce expenses and financial performance of upper upscale hotels.

Review of literature

Characterization of the upper upscale hotels

The chain scale classification used in this study follows that of Smith Travel Research, where hotels are classified using a chain scale with seven categories, of which six are associated with chains and one represents independent hotels. The six categories of chain hotels are luxury, upper upscale, upscale, upper midscale, midscale, and economy. The upper upscale is selected for this study because of two main reasons. First, upper upscale hotels characterize the parameters of economies of scale. In the United States, this category has over 1500 properties and over 550,000 rooms, with an average room to property ratio of 361:1, which is the highest in all categories. From a global viewpoint, with over 4200 properties and over 1.2 million rooms, the upper upscale hotels' room to property ratio of 281:1 is also the highest amongst all seven categories. In addition, in the United States, this is also the category that has the highest total rooms revenue, reported at US\$22.1 billion. Moreover, the upper upscale category also has a large variability in size, including properties as small as 91 rooms and as big as 1354 rooms (Table 1).

As upper upscale hotels are full-service hotels, they provide an opportunity to investigate economies of scope, given that they offer multiple products and services including core services such as accommodation, food, and beverage, but also a variety of ancillary services that are formative of a holistic experience for consumers. Yet, as hotels may have more resources, their management tends to have more complex issues to deal with, which limits its capacity to handle tasks simultaneously and prioritize issues efficiently (Ocasio, 2011). Thus, as firms become bigger and more complex, they could be less efficient in deploying IT toward supporting e-commerce and marketing functions, given that successful IT deployment is associated with narrower windows of opportunity primarily due to rapid changes in the e-commerce environment. As such changes may cause economies and/or diseconomies of scale and/or scope (Hallowell, 1999), the upper upscale hotel category—the category most prone to such effects—provides the most appropriate sample for this study.

Table 1. Sample summary statistics.

Variable	Obs	Mean	Std. dev.	Min.	Max.
Rooms revenue	689	14,100,000	9,541,040	2,006,806	53,800,000
GOP	689	7,076,867	5,725,728	1,535,522	33,000,000
NOP	689	5,263,875	4,428,639	3,679,517	23,800,000
Number of rooms (<i>Rooms</i>)	689	379	208	91	1,354
E-commerce expenses (<i>Ecommerce</i>)	689	44,961	62,904	40	831,548
Interaction of e-commerce with number of rooms (<i>Interaction</i>)	689	22,300,000	44,600,000	13,958	421,000,000
Other marketing expenses (<i>Other</i>)	689	33,507	78,626	1,109,141	392,390
Media/outdoor advertising (<i>Ad</i>)	689	58,766	79,356	64	583,937
Total franchise expenses (<i>Royalty</i>)	689	839,032	516,992	10,663	4,402,602
Loyalty program and affiliation fees (<i>Loyalty</i>)	689	240,092	186,465	–	1,433,612
Franchise advertising and marketing assessment (<i>FAd</i>)	689	245,415	198,752	–	1,251,641

Note: Obs.: number of observations; Std. dev.: standard deviation; Min.: minimum; Max.: maximum; GOP: gross operating profit; NOP: net operating profit.

The upper upscale hotel category consists of brands such as Marriott, Hilton, Sheraton, Hyatt, and Embassy Suites. These five brands occupy the top five places both in property and room count (except Hyatt: fourth in room count and fifth in property count, and Embassy Suites: fourth in property count and fifth in room count). From an e-commerce point of view, the upper upscale hotels have had an interesting evolution during the recent past. Like all hotels with an online presence, they have been influenced by the disintermediation–reintermediation processes of the last decade, with lasting effects on their ability to generate revenues from direct bookings and maintain their market positions. Such changes in the value chain dynamics, associated with radical consumer behavior shifts (e.g. price-driven search), created conditions for upper upscale hotels to reevaluate the core e-commerce strategies that were normative of the last decade. Such strategies were redeveloped, by viewing the storefront website as the main component of the e-commerce strategy, given its dual function: (1) main retail outlet to drive the most direct bookings and (2) the main portal for most customer relationship functions.

More recently, the economic recession and the fast development of metasearch invigorated the hotel e-commerce. Initially, while the recession was severe for the entire US economy, its effects were differential or lagged among various US regions, thus creating unique subregional economic environments, of which hotels were an integral part. Later, as the recession was gradually lessening its effects, metasearch experienced unprecedented popularity. Accordingly, hotel storefront websites were listed in the same result screens with their retail competitors (i.e. OTAs), thus providing a more equitable competitive environment for the hotels, but putting more pressure on their websites and overall e-commerce strategies (e.g. flawless websites, efficient marketing/branding, competitive/matching pricing). All of these factors created specific local economic conditions for hotel properties, which had to develop e-commerce strategies to adapt to such conditions. Accordingly, hotel decision makers had to adapt specific elements of the strategy to respond to such conditions regardless of the level of control over the e-commerce strategy at the property level (e.g. likely full in some properties, limited by corporate headquarters in others). Thus, while their focus on certain types of resources may have been differential from property to property resulting in more emphasis being placed on certain elements of the e-commerce strategy

(e.g. website functionality or aesthetics), their overall approach was relatively similar: They had to appropriate and deploy e-commerce resources, which reflected in their cost structures.

To accomplish its goal and objectives, this study examines how hotel size moderates the impact of e-commerce expenses on the financial performance of hotel properties that reported e-commerce expenses during 2007–2012, using same store data from US-based upper upscale properties supplied by PKF, a leading US hospitality consulting firm. Same store data, also known as comparable/identical store sales, contain financial performance of a certain period of time from the same hotel property, making the study and the results more meaningful than simply examining the financial performance during a particular year. PKF follows the Smith Travel Research chain scale classification method and also uses the Uniform System of Accounts for the Lodging Industry (USALI) to set guidelines for their data collection.

IT, productivity, e-commerce, and financial performance

IT has seen a tremendous development in the last few decades. In the 1990s, IT took the form of proprietary systems, where only firms with substantial resources could afford to be a player (Wang, 2010). Especially during the past decade, as IT became more mainstream and affordable, mainly due to competition, outsourcing, web IT, and enterprise resource planning (Masli et al., 2011), more companies, regardless of size, are able to deploy IT. While intuitively it can be argued that IT increases productivity and thus performance, recent research seems to be increasingly skeptical about the positive role of IT on firm performance (Chae et al., 2014).

Barua and Mukhopadhyay (2000) grouped the literature of IT and productivity into two streams. The first stream, production-economics-based research, utilized production functions to assess the input–output relationship driven by IT, and generally supports the notion that there is a positive relationship between IT and productivity (Chan, 2000). The second stream, the process-oriented research, examines how IT investments influence firms' intermediate operational performance, which is expected to lead to higher financial results (Barua and Mukhopadhyay, 2000). The research in hospitality that focuses on the drivers of hotel performance can also be categorized into two main streams: strategic and value chain drivers. In the strategic stream, such drivers include pricing strategies, brand affiliation, hotel type and size, and hotel management style (Claver-Cortés et al., 2007; Gursoy and Swanger, 2007). In terms of value chain, the actions of employees and customers have been found to be impactful on a firm performance (Chi and Gursoy, 2009).

The literature in hotel marketing expenses shows different marketing expenses contribute differently to revenue and profitability in hotels (Hua et al., 2015; O'Neill and Matilla, 2006). Beginning with its 10th edition of the USALI published in 2006, e-commerce is recognized as a separate line item under marketing expenses within the Sales and Marketing schedule (Hotel Association of New York City, 2006). The USALI defines e-commerce as “the cost of Web site development and maintenance, including Web site registration fees, link costs, and the cost of producing a virtual tour.” (Hotel Association of New York City, 2006: 142). Thus, apart from the other marketing expenses such as media advertising, outdoor advertising, loyalty programs, or franchise advertising, e-commerce reflects the entire process of the design, communication (e.g. promotion), delivery/fulfillment, and evaluation of the entire hotel experience. Given the importance of e-commerce and the new guidelines, industry analysts such as PKF started collecting data on this new line item beginning in 2007.

The classic strategic management literature argues that IT may influence a firm's financial performance through increasing revenues and/or reducing costs (Porter, 2001). Such effects could

be realized even by smaller firms, arguably due to globalization, outsourcing, decreasing cost of hardware, and the emergence of a myriad of vendors (Masli et al., 2011). Earlier conceptual work in hospitality suggested (but not confirmed) that IT investments could eventually lead to long-term profitability and strategic alignment (Chathoth, 2007; Kim and Oh, 2004). Moreover, Connolly and Olsen (2000) emphasized the strong strategic role of IT in developing firm advantages, although not empirical validation was provided. Empirical evidence was eventually provided in a study of IT applications in Korean hotels, where front-office applications, back-office applications, and food-service systems impacted performance, while guest-related interface applications did not (Ham et al., 2005). While the current e-commerce systems are substantially different than those examined in the empirical research discussed above (e.g. Ham et al., 2005), their positive effect on performance should still conform to the theoretical mechanisms outlined in Porter (2001), amply reiterated by hospitality theorists such as Connolly and Olsen (2000) and others, and confirmed empirically by Hua et al. (2015). Thus, based on the discussion above, the following hypothesis was developed.

H1: E-commerce expenses positively impact firm performance.

The moderating role of size

While prior studies have in general assumed that the impact of e-commerce expenses on firm performance is monotonic and independent of firm size (e.g. Chae et al., 2014; Chathoth, 2007; Ham et al., 2005; Masli et al., 2011), several authors provided support for the thesis that the impact of e-commerce expenses could depend on firm size (e.g. Chen and Hambrick, 1995; Donaldson, 2001; Hambrick et al., 2005; Ocasio, 2011; Van de Ven and Jeurissen, 2005), exacerbating the tension between these two divergent perspectives.

According to the resource-based theory, larger firms typically have more resources than smaller firms (Gupta, 1969); they often find themselves better poised to allocate resources (Van de Ven and Jeurissen, 2005) and have better chances to succeed in utilizing marketing as a result of improved efficiency from economies of scale (Nath et al., 2010). Thus, size could affect firms' capability to invest in and utilize e-commerce (i.e. a subset of marketing under USALI). Moreover, if e-commerce is classified as a discretionary item, larger firms tend to withstand stakeholder pressures better (McGuire et al., 1988), while smaller firms constrained by resources would not afford such a discretionary endeavor (Brammer and Millington, 2006) and typically resort to more traditional means of competition to enhance performance (e.g. Udayasankar, 2008). Furthermore, some e-commerce endeavors tend to rely on complex processes and a large scale to be effective (Al-Qirim, 2003), which could significantly influence the way smaller firms utilize e-commerce (e.g. smaller firms tend to have a lower likelihood of improving profitability and encounter execution issues that would hurt firm reputation and performance when such endeavors are concerned; Ellinger et al., 2003). On the other hand, several researchers (Heskett et al., 1990; Schnieder and Bowen, 1995; Zeithaml et al., 1990) have documented that diseconomies of scale of services in both costs and service quality can occur and seem to exacerbate, as firms grow larger in the service industry. This is true for service organizations because fewer products and services allow staff to improve delivery efficiency at a similar or higher quality standard level, as similar studies as such have used organizations in the hospitality industry such as Disney and Taco Bell Corporation (Hallowell, 1997; Heskett et al., 1990, 1997).

From a firm governance perspective, larger firms are more likely to have well-defined goals, measures, and procedures (Chen and Hambrick, 1995), which could affect how e-commerce is

deployed because they may enjoy systems that are more well developed and efficient to handle external issues at both managerial and functional levels (Donaldson, 2001; Miles, 1987). Clearer structures would give larger firms an advantage to better position themselves to deploy and utilize e-commerce, particularly when expertise and capability are concerned. In addition, larger firms tend to attract more media and stakeholder attention when reporting significant endeavors (Rindova et al., 2006), and at the same time, they should have a greater chance to be more financially successful (Godfrey et al., 2009). As a result, structured guidelines and well-defined procedures are more closely followed by larger and more visible firms to meet the need of communication but not as much by smaller firms (Maignan and Ferrell, 2004). Yet, smaller firms could gain greater marginal utility of improved performance than larger and more visible firms, provided that e-commerce is tailored to differentiate and achieve competitive advantages (Scott and Miller, 2002). Drawing upon core competencies, smaller firms can develop specialized e-commerce activities and implement them with little extra cost to the organization, especially when managerial efforts to sustain high IT capabilities are translated into sustainable competitive advantage (e.g. Masli et al., 2011), which often create or add value to their products and services (Olsen and Roper, 1998). As a result, customers benefit by appropriating a higher value proposition, in addition to other intangible perks such as increased convenience, more friendly transactional, fulfillment, consumption platforms, and systems characterized by playfulness (Morosan and Jeong, 2008). In addition, e-commerce endeavors tend to benefit relationship building with buyers and suppliers (Lee et al., 2013; Lynn, 2004) and adding value by improving core competencies and efficiency in using existing resources (Santarelli and D'Altri, 2003). Therefore, engaging in e-commerce endeavors can help smaller firms to not only attain competitive advantage and enhance performance but also survive in this competitive e-environment.

Transaction cost economics (TCE) also sheds light on the role of size in the relationship between e-commerce and firm performance. When firms within the supply chain start to coordinate their efforts, transaction costs are incurred (Williamson, 1975). Fundamentally speaking, TCE acknowledges that additional costs are incurred if a firm exchanges with external organizations rather than meeting its needs internally—a firm may look for inputs from external organizations because of a wide variety of considerations, such as to attain economies of scale, product licensing, or other cost efficiencies. If a firm has to transact with outside organizations, particularly suppliers, it will look for the most efficient governance mechanism to organize its external transactions and minimize transaction costs (Grover and Malhotra, 2003), which suggests that the impact of e-commerce depends on firm size. *Ceteris Paribus*, e-commerce endeavors by design will lower transaction costs and improve cost efficiency of the firm (Clemons et al., 1993; Garicano and Kaplan, 2001). It appears that improved cost efficiency and lowered transaction costs would benefit larger firms more than smaller firms, considering savings for larger firms tends to be substantially bigger.

Moreover, e-commerce endeavors are found to be associated with strategic outcomes, such as enhanced managerial utility (Kambil et al., 1999) and improved stakeholder relationships (Peterson et al., 1997), as long as the e-commerce endeavors selected are strategic (Chang et al., 2003). Although attractive to all sizes of firms, these strategic benefits tend to be more acute for smaller firms constrained by access to resources—e-commerce endeavors can help secure exclusive access to a variety of resources as the IT underlying e-commerce is protected by patent and difficult for others to imitate. For example, small hotels tend to be more agile in their development of e-marketing approaches (e.g. online promotion, search engine optimization) or CRM protocols initiated from their web landing pages. Therefore, smaller firms that are resource constrained can take on e-commerce endeavors strategically to secure access to critical resources,

sometimes with exclusive rights. In addition, the attention capacity theoretical perspective (Kahneman, 1973; Ocasio, 2011; Van de Ven, 1986) argues that human abilities are bounded in responding to multiple stimuli or activities simultaneously. In other words, firm size could play a critical but negative role in influencing the impact of e-commerce expenses on firm performance, considering managerial attention in larger firms could be diluted and even distracted from their core competencies when carrying out e-commerce endeavors—firm size is shown to have a positive relationship with organizational structure complexity and the number of tasks and contingencies to be handled in a given time period (e.g. Child, 1973; Hambrick et al., 2005).

Therefore, considering that e-commerce endeavors could impact firm performance, the following hypothesis was developed.

H2: Firm size moderates the relationship between e-commerce expenses and firm performance.

Methodology

Same store data of 114 upper upscale hotels that reported e-commerce expense over the years of 2007–2012 were used. PKF Hospitality Research, one of the leading hospitality consulting firms in the United States, supplied the data. Since the USALI first introduced the e-commerce line item in 2006, PKF started to systematically collect e-commerce expenses from individual hotels and include the line item as part of its database for its Trends[®] publication. The designation of e-commerce expenses as its own line item, similar to other expenses such as franchise royalty, franchise advertising and marketing assessment, loyalty programs and affiliation fees, media/outdoor advertising, and all other marketing, offers an unprecedented empirical opportunity to investigate the impact of e-commerce on hotel performance.

The data fields available from the 2007–2012 PKF database include the number of guest rooms (*Rooms*), e-commerce expenses (*Ecommerce*), media/outdoor advertising (*Ad*), total franchise expenses (*Royalty*), loyalty programs and affiliation fees (*Loyalty*), franchise advertising and marketing assessment (*FAd*), other marketing expenses (*Other*), rooms revenue (*REV*), and *GOP*, for all the sampled firms during these years.

In order to examine the moderating effect of property size on top (rooms revenues) and bottom-line (*GOP*) financial performance, an interaction term (*INT*) was created to reflect the moderating effect of hotel size, as measured by the number of rooms, and e-commerce expenses. This interaction term was then used in two regression analyses in order to determine whether it had any significant impact on the two measures of financial performance, namely rooms revenue and *GOP*. To address both objectives of the study simultaneously, that is, to examine the impact of e-commerce expenses and that of the e-commerce-size interaction term on rooms revenue and *GOP*, two multiple regression models were developed, extending the approach of O'Neill et al. (2008): Model 1 used rooms revenue (*REV*) as the dependent variable, and the number of guestrooms, e-commerce expenses, the e-commerce/size interaction term, media/outdoor advertising, total franchise, loyalty program and affiliation fees, franchise advertising and marketing assessment, and other marketing expenses as independent variables. Model 2 differs from model 1 by replacing *REV* with *GOP* as the dependent variable to address the bottom line impact.

$$REV = \alpha + \beta_1 Rooms + \beta_2 Ecommerce + \beta_3 INT + \beta_4 Other + \beta_5 Ad + \beta_6 Royalty + \beta_7 Loyalty + \beta_8 FAd + \varepsilon \quad (1)$$

$$\begin{aligned}
 GOP = & \alpha + \beta_1 \text{Rooms} + \beta_2 \text{Ecommerce} + \beta_3 \text{INT} + \beta_4 \text{Other} + \beta_5 \text{Ad} + \beta_6 \text{Royalty} \\
 & + \beta_7 \text{Loyalty} + \beta_8 \text{Fad} + \varepsilon.
 \end{aligned}
 \tag{2}$$

Both models were analyzed using the full data set. Two statistical procedures were followed for sensitivity purposes. First, pooled regressions were run for both models 1 and 2, with the coefficient estimates of *Ecommerce* and *INT* tested statistically by using Newey–West heteroscedasticity and autocorrelation consistent (HAC) standard errors (Newey and West, 1994), accommodating potential autocorrelation and heteroscedasticity issues that could have resulted from the nature of the data reporting (Gujarati, 2003). Newey–West standard errors are commonly employed in financial panel data analysis to account for the potential bias of ordinary least square estimators’ variances and that of *t*-values due to autocorrelation and heteroscedasticity (e.g. Hua and Lee, 2014; Kang et al., 2010). In addition, considering the well-known fixed effects encountered in the hotel industry, such as location and brand (Lee et al., 2014), fixed effects models were run on both models 1 and 2 to confirm that results from the pooled regression are robust. The two models were able to consistently capture not only the marginal effect of e-commerce expenses on both measures of financial performance: *REV* and *GOP* but also the moderating effect of firm size on the relationship between e-commerce expenses and financial performance, while holding all controlled variables such as other types of marketing expenses constant—significant coefficient estimates for β_2 and β_3 would provide direct evidence in support of the study hypotheses.

Results and discussion

Table 1 provides the summary statistics. A total of 689 observations were used from 114 hotel properties. The average number of room per property was 379 with a minimum of 91 and a maximum of 1345. In addition, the average rooms revenue was at US\$14.1 million with an average *GOP* of US\$7.08 million and a net operating profit of US\$5.26 million. The highest expense was royalty, having an average of US\$839,000, followed by franchise advertising and marketing assessment at US\$245,415, and loyalty programs and affiliation fees at US\$240,092. Media and outdoor advertising ranked fourth at the average of US\$58,766, while e-commerce came it at the average of US\$44,961. It is, however, interesting to note that the maximum recorded for e-commerce was as high as US\$831,548, while the highest in media and outdoor advertising was only at US\$583,937. An illustration of the correlations among the variables used in this study is presented in Table 2.

The analysis of model 1 (Table 3) indicates that the model overall was able to explain approximately 80% of the variability of rooms revenue, which is an indication of the suitability of this model to explain rooms revenue is a measure of performance by using a number of marketing expenses and the size of the hotel property as independent variables. The examination of the roles of the various marketing expenses is consistent across the analyses (i.e. fixed effects, Newey–West). That is, e-commerce expenses seem to be the strongest predictor of the rooms revenue, followed by loyalty program in affiliation fees and franchise advertising and marketing assessment. Interestingly, the results show a negative effect of the total franchise expenses and a relatively small effect of media/outdoor advertising and other marketing expenses. Most interestingly, it was observed that the interaction between e-commerce and the number of rooms has a significant and very low negative effect on rooms revenue.

The results for model 2 (Table 4) are consistent with the results of model 1. That is, all predictors of *GOP* explained approximately 63% of its variability. Of all the predictors, the highest

Table 2. Correlation matrix of the study's variables.

Variables	1	2	3	4	5	6	7	8	9	10	11
1 Rooms revenue	–										
2 GOP	0.92	–									
3 NOP	0.89	0.99	–								
4 Number of rooms (<i>Rooms</i>)	0.82	0.69	0.66	–							
5 E-commerce expenses (<i>Ecommerce</i>)	0.37	0.27	0.23	0.40	–						
6 Interaction of e-commerce with number of rooms (<i>Interaction</i>)	0.52	0.35	0.32	0.64	0.87	–					
7 Other marketing expenses (<i>Other</i>)	0.20	0.23	0.22	0.19	0.17	0.14*	–				
8 Media/outdoor advertising (<i>Ad</i>)	0.41	0.45	0.45	0.36	0.17	0.20	0.41	–			
9 Total franchise expenses (<i>Royalty</i>)	0.53	0.42	0.40	0.51	0.48	0.58	–0.03 [^]	0.23	–		
10 Loyalty program and affiliation fees (<i>Loyalty</i>)	0.66	0.55	0.52	0.59	0.49	0.60	0.15*	0.38	0.78	–	
11 Franchise advertising and marketing assessment (<i>FAd</i>)	0.44	0.32	0.34	0.37	0.11*	0.25	–0.15	0.09**	0.44	0.14*	–

Note: GOP: gross operating profit; NOP: net operating profit.

* $p < 0.01$.

** $p < 0.05$.

[^]Not significant. All other values are significant at $p < 0.001$.

impact was attributable to e-commerce experiences (direct effect), followed by loyalty program and affiliation fees, and media/outdoor advertising. Similar to model 1, the effect of total franchise expenses on GOP was negative. Interestingly, the interaction between e-commerce and the number of rooms was significant, yet a low magnitude predictor of GOP. Similar to model 1, the results are consistent between the analyses.

The results presented here seem to suggest that the approach taken in this study to examine the role of marketing expenses reported in the USALI in influencing common measures of hotel financial performance is appropriate, which is illustrated by the high percentage of the variability in the dependent variables explained by their predictors. Not surprisingly, in a world dominated by a strong immersion in IT, e-commerce expenses turned out to be the strongest predictor of hotel performance in upper upscale hotels. Also, as one may expect, the role of the brand in influencing the hotel performance was also revealed through the analysis presented above. For example, the role the loyalty program is emphasized, as loyalty expenses influenced both rooms revenue and GOP.

Perhaps the most interesting result gravitates around the role of the interaction effect between e-commerce expenses in the number of rooms. The effect was significant, but very low and also negative on both measures of financial performance. This result seems to suggest that, in larger hotels, deploying higher e-commerce expenses is expected to result in a slight decrease in rooms revenues and GOP relative to smaller hotels. This could be attributable to the fact that larger hotels that spend more on e-commerce could become less agile in its deployment and management, and thus are not being able to realize its purported benefits. Moreover, hotels that are relatively smaller but invest in e-commerce should see benefits from such investment. Yet, when comparing the magnitude of the effect of size

Table 3. Model I testing results ($R^2 = 0.79$).

Fixed effects	Coef.	Robust				
		Std. err.	t	p > t	[95% confidence interval]	
Rooms revenue						
Number of rooms (<i>Rooms</i>)	-26,344.57	20,180.08	-1.31	0.19	-66,313.76	13,624.62
E-commerce expenses (<i>Ecommerce</i>)	11.89	3.95	3.01	0.00	4.08	19.71
Interaction of e-commerce with number of rooms (<i>Interaction</i>)	-0.03	0.01	-3.38	0.00	-0.40	-0.01
Other marketing expenses (<i>Other</i>)	6.24	1.21	5.16	0.00	3.85	8.64
Media/outdoor advertising (<i>Ad</i>)	6.12	1.63	3.76	0.00	2.90	9.35
Total franchise expenses (<i>Royalty</i>)	5.691	1.40	4.06	0.00	2.92	8.47
Loyalty program and affiliation fees (<i>Loyalty</i>)	2.44	2.22	1.10	0.27	-1.94	6.83
Franchise advertising and marketing assessment (<i>FAd</i>)	3.80	2.41	1.58	0.12	-0.97	8.59
Constant	17,300,000.00	7,694,163.00	2.24	0.03	2,029,443.00	32,500,000.00
		Newey–West statistics				
Number of rooms (<i>Rooms</i>)	30,014.57	2188.36	13.72	0.00	25,717.82	34311.31
E-commerce expenses (<i>Ecommerce</i>)	39.67	7.80	5.09	0.00	24.36	54.98
Interaction of e-commerce with number of rooms (<i>Interaction</i>)	-0.08	0.02	-5.01	0.00	-0.12	-0.050
Other marketing expenses (<i>Other</i>)	4.63	2.56	1.81	0.07	-0.39	9.64
Media/outdoor advertising (<i>Ad</i>)	3.86	3.12	1.24	0.22	-2.27	9.98
Total franchise expenses (<i>Royalty</i>)	-4.52	1.01	-4.47	0.00	-6.51	-2.53
Loyalty program and affiliation fees (<i>Loyalty</i>)	26.00	3.45	7.55	0.00	19.24	32.76
Franchise advertising and marketing assessment (<i>FAd</i>)	14.64	2.55	5.75	0.00	9.64	19.64
Constant	-3,617,612.00	637,725.80	-5.67	0.00	-4,869,760.00	-2,365,464.00

Note: Coef.: coefficient; Std. err.: standard error.

between the e-commerce expenses' direct effect and that of the interaction term, it is important to recognize the critical role of e-commerce expenses in solely influencing both measures of hotel financial performance on all hotels. That is, the low magnitude of the regression coefficient of the interaction term between e-commerce and the number of rooms points to the conclusion that the influence of e-commerce overwhelms that of the hotel size and reinforces the notion that e-commerce expenses are valuable ways in which hotels can increase their financial performance.

Table 4. Model 2 testing results ($R^2 = 0.63$).

Fixed effects	Robust					
	Coef.	Std. err.	t	p > t	[95% confidence interval]	
Gross operating profit						
Number of rooms (<i>Rooms</i>)	-70,911.87	28,369.59	-2.50	0.01	-127,101.40	14,722.31
E-commerce expenses (<i>Ecommerce</i>)	8.07	4.00	2.02	0.05	0.15	16.00
Interaction of e-commerce with number of rooms (<i>Interaction</i>)	-0.03	0.01	-4.67	0.00	-0.04	-0.02
Other marketing expenses (<i>Other</i>)	4.47	1.52	2.94	0.00	1.46	7.48
Media/outdoor advertising (<i>Ad</i>)	7.02	2.13	3.29	0.00	2.79	11.24
Total franchise expenses (<i>Royalty</i>)	3.73	1.60	2.33	0.02	0.56	6.90
Loyalty program and affiliation fees (<i>Loyalty</i>)	0.16	2.26	0.07	0.95	-4.32	4.63
Franchise advertising and marketing assessment (<i>FAd</i>)	3.38	2.43	1.39	0.17	-1.43	8.19
Constant	29,700,000.00	10,800,000.00	2.74	0.01	8,234,840.00	51,200,000.00
	Newey–West statistics					
Newey–West						
Number of rooms (<i>Rooms</i>)	18,820.79	1956.59	9.62	0.00	14,979.11	22,662.47
E-commerce expenses (<i>Ecommerce</i>)	37.63	8.76	4.30	0.00	20.43	54.83
Interaction of e-commerce with number of rooms (<i>Interaction</i>)	-0.09	0.02	-4.57	0.00	-0.12	-0.05
Other marketing expenses (<i>Other</i>)	2.68	2.36	1.14	0.26	-1.95	7.30
Media/outdoor advertising (<i>Ad</i>)	8.86	3.03	2.92	0.00	2.90	14.81
Total franchise expenses (<i>Royalty</i>)	-2.11	0.75	-2.83	0.01	-3.58	-0.65
Loyalty program and affiliation fees (<i>Loyalty</i>)	13.17	2.64	4.98	0.00	7.98	18.36
Franchise advertising and marketing assessment (<i>FAd</i>)	5.78	1.60	3.62	0.00	2.65	8.92
Constant	-3,229,232.00	556,817.90	-5.80	0.00	-4,322,521.00	-2,135,943.00

Note: Coef.: coefficient; Std. err.: standard error.

The fact that e-commerce expenses are relatively high to the other marketing expenses and are very high compared to the interaction term of e-commerce expenses and hotel size underscores the critical role of e-commerce expenses in the array of marketing expenses of a hotel. It was also very interesting to note that the most important predictors of hotel performance center around the marketing traits that are specific to this type of hotel: usually branded via a recognizable brand, with a strong presence online, strongly represented geographically through franchising. As such,

the approach to marketing that takes into account all of the defining characteristics of the hotel class, but reflected visibly online, should result in a successful recipe for the marketing strategy. Yet, while hotels within this class may vary in size, apparently stronger approach to e-commerce should be able to override the traditional effect of size in offering the financial benefits that are purported by theory. Thus, very importantly, these results seem to suggest that even smaller hotels have a good chance relative to their larger counterparts in successfully implementing e-commerce strategies that could result in financial performance.

A noteworthy contrasting result was found when examining the differential role of the various marketing expenses. While e-commerce and its corresponding brand-related expenses dominate the predictor landscape, the traditional marketing approaches, such as media/outdoor advertising and unclassified (i.e. other) marketing expenses, do not have a strong influence on financial performance. This seems to indicate that, in a marketing environment dominated by an increasing orientation of both consumers and firms toward e-commerce, the alternative tools of marketing remain inefficient in their ability to influence financial performance. Moreover, these results seem to substantiate the notion that hotels could eventually move to a marketing strategy based on e-commerce tools that can only mediate the consumer experience that remains traditional, in the most classic sense of hospitality (i.e. rewarding guests through loyalty programs, building a strong brand via the loyalty program). Overall, these results indicate that e-commerce should be viewed as perhaps the most critical marketing tool that could be employed by a hotel today, but it would be even more successful if deployed in conjunction with complimentary marketing tools, and taking into account the size of the hotel when deploying such strategies.

Conclusions and implications

Overall, this study offers empirical evidence that upper upscale hotels that reported e-commerce expenses show e-commerce expenses as the strongest predictor of financial performance, especially when hotel size is considered. All these results offer the following implications for theory and practice.

Academic implications

The results of this study add to the hospitality e-commerce and financial performance literature by providing the first comprehensive study of the moderating effect of firm size, and serves as a base for future systematic studies of the impact of not only e-commerce but also other marketing expenses on the profitability of hotels in different categories, or the industry as a whole. As the first study using concrete e-commerce data, this study is critical. As Bhatt and Grover (2005) and Mithas et al. (2011) commented, it is arduous to examine the impact of firms' performance by separating e-commerce from the other marketing expenses because IT comprehensively influences all business processes. The change in the USALI 10th edition in 2006 makes this a reality.

Besides examining e-commerce, another academic implication is that this study represents an initial blueprint for future analyses of the impact of other expenses and the most effective combination of complementary marketing tools in specific chain scales. While this study concentrates on the upper upscale hotels, similar studies can be performed on other chain scales and other expense line items or categories. In addition, the results not only add to the literature in hospitality finance but also in hospitality marketing, as it underlines a methodology for establishing the effect of various types of expenditures on financial performance. Thus, future studies

to examine the impact of different expense line items and/or categories in other chain scales can also be carried out.

Third, the results of this study also add a different dimension to the theories of economies of scale and economies of scope regarding e-commerce expenses in the lodging industry. While the interaction effect between e-commerce expenses in the number of rooms was significant, it was very low and also negative on both measures of financial performance. Therefore, while economies of scale can provide cost advantages to bigger hotels in that the e-commerce expense per room is lower, the returns on rooms revenues and GOP are not higher than those of the smaller hotels. In addition, larger hotels generally offer more products and services than smaller hotels. In this study, the results also did not support economies of scope. When dealing with IT changes, smaller hotels are more agile in the deployment and management of IT, and thus they are able to realize the benefits at a higher rate than larger hotels. The most important note, however, is that with the low magnitude of the regression coefficient of the interaction term between e-commerce and the number of rooms, one can safely conclude that e-commerce can increase financial performance.

Another academic contribution of this study is that it is grounded in a broader data analysis, which includes 6 years of data, thus making the results more meaningful relative to the industry context. Longitudinal data are often difficult to obtain because the time and monetary resources to collect data repeatedly are often enormous. With the assistance of PKF, this data set of a 6-year period also allows this research to capture the collection of e-commerce at the very inception of it being a separate expense line item in the hotel industry. In addition, these data capture some other interesting industry factors, such as the mobile orientation, which makes the role of the branded website central to the hotel's consumer relationships, and the emergence of metasearch, which offers branded hotel websites unique opportunities to position themselves better in the merchandizing space, along with third-party intermediaries within consumers' search queries.

Managerial implications

Besides its theoretical implications, this study also offers several actionable implications for managerial practice. First, it proves through both models that e-commerce expenses have the highest impacts of all factors in explaining the variability of financial performance in upper upscale hotels. Therefore, if any hotelier is still wondering whether his or her hotel should engage in e-commerce, the uncertainty can be put aside. For example, the rapid development of mobile-commerce (m-commerce) necessitates sustainable deployment managerial practices. E-commerce has become such an integral part of novel evolutionary business contexts, where the key to success is seamlessly integrating IT with all other business model components. Indeed, in the newest edition of the USALI, the 11th revised edition published in 2014, and which takes into effect January 1, 2015, the line item "e-commerce" is now called "website." While the first part of the definition of "website" is exactly the same as "e-commerce" of the old edition, the new definition has following added:

key words buy, content management, costs related to new media including social and mobile, search engine optimization, dynamic landing page management, hotel response costs to third-party consumer sites such as TripAdvisor, online marketing planning, and centralized labor or centrally managed costs associated with e-commerce that are distributed to the local property. (Hotel Association of New York City, 2014: 108–109)

Thus, the natural transcendence of e-commerce into m-commerce is captured going forward.

Second, this is the first study investigating the impact of e-commerce expense on financial performance considering the size of the hotel properties. As the results indicate, while the size of a hotel matters in the statistical sense, it does not make a difference in the practical sense. That is, smaller hotels that may think they are not as competitive as their bigger counterparts should not shy away from e-commerce activities; they could be more nimble in making changes and serving their guests better and therefore yielding better rooms revenue and GOP. In some respects, having a functional, user friendly, and attractive website may be more critical for small independent hotels as they are in keen competition with the mega brands that have the resources necessary to employ the multidisciplinary teams (e.g. web designers, development staff, revenue and marketing/branding experts, property managers) who can properly build and maintain good websites. Moreover, the level of control that decision makers have over various e-commerce expenses could be different among properties, as certain properties may have limited control due to corporate involvement, while other properties, typically smaller, may have more control but face challenges in acquiring and deploying resources. Nevertheless, as today's hotel retail landscape is becoming increasingly crowded, having a good e-commerce strategy that gravitates around a good storefront website is fundamental to all types of properties. Therefore, hoteliers should not only use the size of their hotels to determine whether they should engage in e-commerce or m-commerce. Rather, they should embrace the opportunities that e-commerce provide to connect and cocreate value with their guests for their best lodging experiences.

Third, while it is obvious that while e-commerce expense has the biggest impact on financial performance, e-commerce alone will not win the battle. A combination of carefully selected marketing tools that can form a viable strategy is more important. Hotel guests can be characterized using a multitude of attributes and thus form different preferences, needs, wants, and expectations. Even when a hotel is more geared toward serving a business clientele, all business travelers are not the same. Some prefer booking online while others book through their corporate travel agency. Some are loyal to a certain brand, while others, more on a budget, will seek the best value. From print media to e-media, from loyalty programs to franchise designated marketing and advertising, hotels need to find the best combination of all marketing tools to maximize their yields.

Limitations

This study has several limitations, and thus, its results should be interpreted with caution. However, such limitations allow for outlining fruitful areas of further research. First, the data were collected during a period of time in which reporting standards changed. The year 2007 was the first year hotels followed the new USALI guidelines, and some hotels did not change their reporting until later due to management contracts and other reasons. Therefore, only hotels that consistently reported e-commerce are included in the sample. Second, although this study spans a period of 6 years and is more meaningful than a single year data, a 6-year span may still limit understanding of the long-term dynamics of the e-commerce impact. With increased use of e-commerce and m-commerce, it will be important for further research to include a longer time period to explore the long-term relationships involving e-commerce and size. Third, the differences in size, revenues, and expenses among the properties that are inherent to this particular category of hotels may influence the role of size in influencing the relationships leading to financial performance. Thus, future research relying on larger samples could investigate the

effects of various subcategories within the upper upscale category, which could reveal interesting effects of size, corroborated with e-commerce expenses. Fourth, due to resource constraints, this study relied solely on the secondary data set provided by PKF; thus limiting its generality. In the future, primary data could add another layer of sophistication to future research with regard to e-commerce and size. For example, focusing on specific elements of the e-commerce strategy (e.g. specific website attributes such as usability of aesthetics) could provide a more precise illustration of the inner mechanics that turn e-commerce efforts into performance. Finally, from a marketing function evaluation viewpoint, it would be very beneficial to include other measures of performance as dependent variables, which are not necessarily reflective of an immediate effect of a hotel property's marketing strategy. For example, the rapid development of e-commerce over the study timeframe may lead one to argue that the measurement of e-commerce impacts should be extended beyond a simple dollar amount spent to the actual guest-front website in terms of the site's visual attraction, color template, functionality, usability, detailed services, linkages to social media, or even multilingual capability (Huang, 2009). Market share could also be a very useful dependent variable to explore, as upper upscale hotels are very market share driven, both at local and brand level.

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