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ABSTRACT

Human capital plays an essential role in firm success in the hospitality industry (Baum, 2015; Tracey, 2014); however, how the mechanism through which human capital contributes to a hotel's performance remains unclear (Bagri et al., 2010; Domínguez-Falcón et al., 2016; Ooi et al., 2015). By extending Hua et al. (2015) and O'Neill et al. (2008), this study systematically examined the impacts of human capital, proxied by Total Labor Expenses at different lagged time points, on hotel operating performance, while controlling for a comprehensive array of potential confounding variables. This study offers a more holistic view of whether human capital influences hotel operating performance, and if so, how. It further sheds light on explaining the mixed results from prior research. The employment of the fixed effects model framework also enables control for fixed effects variables such as chain scale and location.

Keywords: human capital, operating performance, hotel

Introduction

Human capital plays an essential role in firm success in the hospitality industry (e.g., Baum, 2015; Tracey, 2014), largely because it improves the success of interactions between employees and customers (Ford et al., 2012). Since employee commitment and satisfaction have attracted a significant amount of attention recently (e.g., Karatepe, 2013; Sikora & Ferris, 2014), studies have argued and shown that high-commitment human resources practices are related to performance by using surveys and interviews (e.g., Mitchell et al., 2013; Razouk, 2011). However, the vast majority of these studies explored such relationships at the employee level (e.g., Yang, 2010) and rarely considered the opinions of management (e.g., Kim & Brymer, 2011). In addition, the majority of the studies made their arguments and claims based on a very small sample, often only one informant (Domínguez-Falcón et al., 2016). As a result, conclusions could be sensitive to the sample selection (e.g., Luoh et al., 2014).

Given the resource-based view (RBV) that furnishes the theoretical framework (e.g., Barney, 1991) which governs impacts of intangible assets on performance at the firm level, organizational theorists have argued that human capital plays a critical role in achieving sustainable competitive advantages (e.g., Nyberg et al., 2014) and helping to improve performance (e.g., Lonial & Carter, 2015). Human capital appears to typically result from practical learning, experiences, and education (e.g., Lee et al., 2016) and encompasses the "training, experiences, judgment, intelligence, relationships and insight" (Barney, 1991, p. 101).

There are also a number of challenges associated with human capital in the highly competitive hospitality industry. For example, issues such as attraction and development have kept managers and owners concerned (Enz, 2009). Besides, seasonality demand brings additional challenges such as high employee turnover, difficulty assessing the benefits of training, and the expertise needed for improving business performance (e.g., Zwane et al., 2014). These challenges are even taken as inevitable and a natural part of the process (e.g., Haven-Tang & Jones, 2006). However, due to human capital's nature of intangibility and lack of accurate measurements, few prior

studies offer a systematic examination of human capital from a quantitative and financial perspective (e.g., Sardo et al., 2018), leaving a stunning void in hospitality literature. It is unclear how the mechanism through which human capital contributes to hotel performance works (e.g., Bagri et al., 2010; Domínguez-Falcón et al., 2016; Ooi et al., 2015).

In the generic field of studies, it is widely recognized that firm-specific human capital is a critical resource for superior firm performance (e.g., Crook et al., 2011). Extant literature on the RBV and resource allocation has emphasized the importance of organizing firm-specific human capital to fully exploit it. However, because established resource exploitation practices typically do not provide good guidance for firms with idiosyncratic resources, it becomes a complex issue to exploit firm-specific human capital (e.g., Andersén, 2019). Nevertheless, the generic literature also lacks studies that have empirically investigated how to utilize firm-specific human capital (e.g., Andersén, 2019). As a result, this study was designed to explore if and how human capital financially enhances firm performance from an RBV perspective. In particular, this study attempts to address the following questions: Does human capital affect hotel operating performance? And does the impact of human capital last for more than one year? The empirical evidence provided by answering these two questions will provide managers with the impetus to improve their human capital deployment and resource allocation for superior performance.

The rest of this paper is organized as follows: section 2 reviews the relevant literature and proposes the hypotheses. Section 3 describes the data set and methodology, with results reported in section 4. Conclusions and implications are discussed in section 5, with the limitations of this study summarized in section 6.

Literature Review

Background

In the field of strategic management, it is commonly recognized that the RBV is one of the most widely accepted theoretical perspectives (e.g., Rouse & Daellenbach, 2002). From an RBV perspective, the endowment and effective exploitation of particular combinations of resources are fundamental for firms to achieve superior performance (Chang et al., 2016) because valuable, rare, unique, and difficult-to-imitate resources secure competitive advantages (Barney, 1991). Variability in resource endowment and deployment across firms implies that possession of unique resources appears to better equip some firms to succeed in particular activities (Kozlenkova et al., 2014). As a result, small firms such as independent hotels tend to be constrained by their limited access to financial and tangible resources and in turn are faced with limited feasible strategic options (Jogaratnam, 2018; Porter, 1985). Intangible resources and capabilities may become more important for small firms to secure competitive advantages given their limited access to tangible and financial resources (Greene & Brown, 1997) since intangible resources are also characterized by properties such as being rare, embedded in company routines, and difficult to imitate (Peteraf & Barney, 2003; Hitt et al., 2001).

Human Capital and Operating Performance

Since Nobel Prize–winner Gary Becker (1964) argued that there are "activities that influence future monetary and psychic income by increasing the resources in people" (p. 11) and started to develop the theory of human capital, many scholars have looked into and examined different aspects of human capital (e.g., Hitt et al., 2001; Takeuchi et al., 2007; Wright & McMahan, 1992). Over time, human capital has been considered as a resource that secures firms with competitive advantages (Hitt et al., 2001; Javalgi & Todd, 2011; Nyberg et al., 2014), and many human capital attributes have been shown to relate to entrepreneurial success (Unger et al., 2011). For example, human capital is shown to relate to entrepreneurial discovery and the successful exploitation of opportunities (Davidsson & Honig, 2003). In addition, it appears to be linked to performance (e.g., Gimeno et al., 1997; Takeuchi et al., 2007). However, the majority of these studies explored the impact of human capital on non-financial performance at the employee level (e.g., Yang, 2010) and derived their arguments based on very small samples (Domínguez-Falcón et al., 2016). For example, the collective human capital appeared to exert a positive impact on a manager-assessed organizational performance rating (Takeuchi et al.,

2007) and lead to better organizational performance (Crook et al., 2011), since prior education and experience could enhance practitioners' understanding of market conditions and improve their opportunities to succeed in navigating the marketplace (Finkelstein & Hambrick, 1996). In addition, opportunity identification and exploitation appeared to associate with a deeper understanding of specific industry challenges, customer service, and service recovery strategies (Jogaratnam, 2018).

In hospitality and tourism literature, human capital has been studied extensively in the strategic human resource management area (Madera et al., 2017), with the focus placed on high-commitment human resource practices (Domínguez-Falcón et al., 2016). For instance, a large number of inter-related human resource practices were studied to understand how added value can be generated for a firm (Guthrie, 2001), such as "high-involvement" (Guthrie, 2001; Macky & Boxall, 2008; Paré & Tremblay, 2007), "high-commitment practices" (Hauff et al., 2014; Iverson & Zatzick, 2007; Kwon et al., 2010), "flexible" or "innovative" (Godard, 2001; Thompson, 2007), "high-performance" (Jiang et al., 2012; Karatepe, 2013; Kehoe & Wright, 2013), or "best practices" (Paauwe & Boselie, 2005; Theriou & Chatzoglou, 2009). Resilience, optimism, hope, and self-efficacy (i.e., positive psychological capital) were also shown to affect organizational citizenship and employee job satisfaction in a hotel context (Jung & Yoon, 2015). In particular, hotel companies would find their employees critical in creating value perceived by customers given the intangible nature of the services they provide (Luoh et al., 2014).

Strategic human resource management appeared to affect the human and social capital of employee and visitor attitudes (Graham & Lennon, 2002). In particular, Spanish hotels with human resource management focusing on employee human capital performed better than those that did not focus on human capital (Úbeda-García et al., 2013). A lack of investment in human capital, such as training, working conditions, and hours, was found in a sample of Indian hotels located in the Himalayas, leading to high turnover (Bagri et al., 2010). Education and work experience were used as measures of human capital in Ooi et al. (2015) to examine the impact of human capital of the board of directors

on firm performance based on a sample of 85 tourism firms in China, Malaysia, Hong Kong, and Singapore. They showed that the human capital of the board had a negative impact on firm performance.

Overall, prior studies have focused on a wide variety of topics related to human capital, but the vast majority of them did not examine the connection between human capital and firm financial performance, particularly in the hospitality and tourism industry. As a result, the literature is inconclusive on the relationship and particularly scarce in hospitality and tourism. Given the mixed arguments and findings in the literature, this study proposes the null hypotheses as follow:

H_0: Human capital has no impact on hotel operating performance.

H_{0a}: Human capital has no impact on hotel operating performance one year ahead.

H_{0b}: Human capital has no impact on hotel operating performance two years ahead.

H_{0c}: Human capital has no impact on hotel operating performance three years ahead.

Potential Confounding Variables

Hotel size has been widely recognized to relate to hotel performance due to economies of scale (e.g., DeFranco et al., 2016), while loyalty programs are shown to relate to firms' performance (e.g., Hua et al., 2015). Franchise fees (e.g., Hua et al., 2017) and advertising expenses (e.g., Assaf et al., 2015) are also recognized to positively affect firm operating performance. Besides, expenditures on IT such as IT systems and websites appear also deliver a positive impact on hotel operating performance (e.g., Hua, 2020). And lastly, location and chain scale appear to also relate to hotel performance (e.g., Xie et al., 2016).

Methodology

Data

To examine the impact of human capital on hotel operating performance, this study collected same-store data of 1,471 hotels between 2010 and 2017 from CBRE Hotels Research, totaling 10,297 observations. CBRE Hotels Research is a leading

hospitality consulting firm under Coldwell Banker Richard Ellis, which is ranked 146th on the Fortune 500 list, and produces historical and projected hotel performance reports that represent the entire American hotel market (CBRE, 2020).

Model

This study built on and extended Hua et al. (2015) and O'Neill et al. (2008) to explore the operating performance impacts of hotel human capital, proxied by the total labor costs—all expenditures related to labor are accounted for by the total labor costs in a sampled hotel, following an accounting-oriented approach of measuring human capital (e.g., Mubarik et al., 2018) by considering human capital as an aggregate firm capability (e.g., Ployhart et al., 2011). A comprehensive set of control variables were used to mitigate the potential impact of omitted variable bias (OVB) (e.g., Assaf et al., 2015). In addition, considering the potential time-invariant heterogeneity issues associated with hotel location and chain scale (e.g., Xie et al., 2016), this study used a fixed-effects model to ensure consistent coefficient estimates of the large panel sample of hotels. In particular, the lagged structure employed by this study would avoid any simultaneity concerns (e.g., Canina & Carvell, 2005; Hua et al., 2017) and followed prior studies (e.g., Assaf et al., 2012) to stop at year t−3.

$$Y = \alpha_0 + \alpha_1 X_1 + \sum_{k=1}^{6} \beta_k Z_k + \varepsilon \qquad (1)$$

Where

- Y = Total Revenue or Earnings before Interests, Taxes, Depreciation and Amortization (EBITDA) in a given year;
- X_1 = Total Labor Expenses in year t−1;
- Z_k is the set of control variables, including the number of rooms, IT System Expenses, Website Expenses, Loyalty Program Expenses, Total Franchise Expenses, and Hotel Advertising Expenses, where k = {1, 2, . . . , 6}.

Significant coefficient estimates for X_1 would indicate empirical evidence rejecting the H_{0a}.

$$Y = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \sum_{k=1}^{6} \beta_k Z_k + \varepsilon \quad (2)$$

Where

- X_2 = Total Labor Expenses in year t−2; X_3 = Total Labor Expenses in year t−3;
- Everything else is as defined under Model (1).

Significant coefficient estimates for X_2 and/or X_3 would indicate empirical evidence against H0b and H_{0c}. Rejecting H_{0a}, H_{0b}, and/or H_{0c} would indicate empirical evidence against H_0.

Results

The hotels sampled in this study appeared representative of U.S. hotels (Table I). For example, total revenue spanned a minimum of $550,678 and a maximum of $435,000,000, with a mean of $10,500,000. Hotel EBITDA ranged from −$16,800,000 to $156,000,000, with a mean of $3,127,168. Among all expenses, labor dominated all other items with a mean of $3,313,957 and a range from $171,425 to $121,000,000. It was, on average, 31.56% of the total revenue. The hotel size averaged 196 rooms per property, with a wide range spanning 41 to 2,860 rooms. Total Franchise Expenses, IT System Expenses, and Loyalty Program Expenses were among the most significant other than labor, standing on average at $328,453, $133,349, and $119,026, respectively. Negative numbers in Table 1 were caused by accounting adjustments, which do not qualitatively affect the study results (Sensitivity tests are carried out by deleting the negative numbers; results are omitted to save space).

Results from Model (1), when Total Revenue was used as the dependent variable, are reported in Table 2, with VIFs computed. Since all VIFs are smaller than 10, multicollinearity is not a serious concern (e.g., Kennedy, 2008). The coefficient estimate of Total Labor Expenses$_{t-1}$ registered at 1.9212 with a 5% significance level, indicating that H_0 and H_{0a} are rejected. The model was estimated with a fixed effect model; as a result, the fixed variables such as location and chain scale are controlled for. Other control variables, such as IT System Expenses, Loyalty Program Expenses, Total Franchise Expenses, and Advertising Expenses, were also significant at the 5% level. Website Expenses are shown to be insignificant.

Table 1. *Descriptive Statistics*

Variable	Number	Mean	Std. Dev.	Min.	Max.
Total Revenue	10,297	10,500,000	24,100,000	550,678	435,000,000
EBITDA	10,297	2,912,891	6,941,010	−16,800,000	156,000,000
Total Labor Expenses	10,297	3,313,957	8,554,169	171,425	121,000,000
Rooms	10,297	196	222	41	2,860
IT System Expenses	10,297	133,349	352,711	0	6,690,045
Website Expenses	10,297	17,812	411,039	−1,279	41,000,000
Loyalty Program Expenses	10,297	119,026	303,515	−163,556	3,590,925
Total Franchise Expenses	10,297	328,453	670,918	−163,481	14,400,000
Advertising Expenses	10,297	33,012	88,748	−7,443	3,183,890

Results of Model (2), when Total Revenue was used as the dependent variable, are reported in Table 3. Total Labor Expenses were shown to be positively significant with coefficient estimates of 1.3952 and 0.2333 in year t−1 and t−3, respectively, and −0.0137 but insignificant in year t−2. As a result, H_0, H_{0a} and H_{0c} are rejected. Similarly, the model was estimated with a fixed effect model to control for impacts of fixed variables such as location and chain scale. Other control variables, such as IT System Expenses, Loyalty Program Expenses, Total Franchise Expenses, and Advertising Expenses, were also significant at the 5% level. Website Expenses were shown to be insignificant.

To examine the bottom line impact of human capital, EBITDA was used as the dependent variable in Model (1). Results of testing Model (1) are

reported in Table 4. Total Labor Expenses were shown to be positively significant with a coefficient estimate of 0.4614 in year t−1. As a result, H_0 and H_{0a} are rejected. The model was also estimated using a fixed effects model. Similarly, other control variables, such as IT System Expenses, Loyalty Program Expenses, and Total Franchise Expenses were also significant at the 5% level. Website Expenses and Advertising Expenses are shown to be insignificant.

Results of Model (2), when EBITDA was used as the dependent variable, are reported in Table 5. Total Labor Expenses were shown to be significant with coefficient estimates of 0.3988, −0.3339, and 0.1005 in year t−1, t−2, and t−3, respectively. As a result, H_0, H_{0a}, H_{0b}, and H_{0c} are rejected. Similarly, the model was estimated with a fixed effect model to control for impacts of fixed variables such as location

Table 2. *Fixed Effects Regression Analysis (Model 1)–Total Revenue as the Dependent Variable*

Variable	Coef.	Std. Err.	t	P>t	95% Conf.	Interval
Total Labor Expenses$_{t-1}$	1.9212	0.0243	79.14	0.0000	1.8736	1.9688
Rooms	60,217	6,542	9.21	0.0000	47,394	73,040
IT System Expenses	5.3542	0.1929	27.76	0.0000	4.9761	5.7323
Website Expenses	0.0181	0.0491	0.37	0.7130	−0.0782	0.1144
Loyalty Program Expenses	5.5043	0.4013	13.72	0.0000	4.7176	6.2909
Total Franchise Expenses	3.6343	0.1200	30.30	0.0000	3.3991	3.8694
Advertising Expenses	5.0363	0.4318	11.66	0.0000	4.1898	5.8828
_cons	−10,200,000	1,287,386	−7.93	0.0000	−12,700,000	−7,686,180

Note: R^2: within = 0.6195; between = 0.9593; overall = 0.9539.
$F_{(7,8819)}$ = 2051.05; corr(u_i, Xb) = −0.9031; Prob > F = 0.000.
Number of obs = 10,297; Number of groups = 1,471; Group variable: PropertyID.

Variable	VIF	1/VIF
Total Labor Expenses$_{t-1}$	9.7	0.1031
Rooms	6.26	0.1599
IT System Expenses	8.62	0.1160
Website Expenses	1.01	0.9900
Loyalty Program Expenses	5.95	0.1679
Total Franchise Expenses	3.71	0.2697
Advertising Expenses	1.65	0.6044
_cons		

Table 3. *Fixed Effects Regression Analysis (Model 2)–Total Revenue as the Dependent Variable*

Variable	Coef.	Std. Err.	t	P>t	95% Conf.	Interval
Total Labor Expenses$_{t-1}$	1.3952	0.0521	26.77	0.0000	1.2930	1.4973
Total Labor Expenses$_{t-2}$	−0.0137	0.0584	−0.24	0.8140	−0.1283	0.1008
Total Labor Expenses$_{t-3}$	0.2333	0.0523	4.46	0.0000	0.1308	0.3358
Rooms	80,223	8,211	10.00	0.0000	64,127	96,318
IT System Expenses	2.9878	0.2107	14.18	0.0000	2.5746	3.4009
Website Expenses	0.0206	0.0448	0.46	0.6460	−0.0672	0.1084
Loyalty Program Expenses	4.6819	0.5045	9.28	0.0000	3.6928	5.6709
Total Franchise Expenses	3.5324	0.1162	30.39	0.0000	3.3046	3.7603
Advertising Expenses	4.6446	0.4449	10.44	0.0000	3.7724	5.5168
_cons	−12,500,000	1,620,404	−7.70	0.0000	−15,600,000	−9,293,706

Note: R^2: within = 0.4726; between = 0.9501; overall = 0.9467.
$F(9,5875) = 584.87$; corr(u_i, Xb) = −0.8843; Prob > F = 0.000.
Number of obs = 7,355; Number of groups = 1,471; Group variable: PropertyID.

Table 4. *Fixed Effects Regression Analysis (Model 1)–EBITDA as the Dependent Variable*

Variable	Coef.	Std. Err.	t	P>t	95% Conf.	Interval
Total Labor Expenses$_{t-1}$	0.4616	0.0191	24.18	0.0000	0.4242	0.4990
Rooms	37,900	5,144	7.37	0.0000	27,818	47,983
IT System Expenses	2.6922	0.1517	17.75	0.0000	2.3949	2.9895
Website Expenses	0.0588	0.0386	1.52	0.1280	−0.0169	0.1346
Loyalty Program Expenses	2.5569	0.3156	8.10	0.0000	1.9383	3.1755
Total Franchise Expenses	1.8329	0.0943	19.43	0.0000	1.6480	2.0178
Advertising Expenses	0.2910	0.3396	0.86	0.3920	−0.3746	0.9566
_cons	−7,278,280	1,012,285	−7.19	0.0000	−9,262,595	−5,293,965

Note: R^2: within = 0.2320; between = 0.7780; overall = 0.7465.
$F(7,8819) = 380.66$; corr(u_i, Xb) = −0.9348; Prob > F = 0.000.
Number of obs = 10,297; Number of groups = 1,471; Group variable: PropertyID.

and chain scale. Other control variables, such as IT System Expenses, Loyalty Program Expenses, Total Franchise Expenses, and Advertising Expenses, were also significant at the 5% level. Website Expenses were shown to be insignificant.

To examine the magnitude differences of the impacts between independent variables, all variables in Model (2) were standardized, and results with Total Revenue and EBITDA as the dependent variable are reported in Tables 6 and 7, respectively. Total Labor Expenses at year t−1 made the second largest contribution to Total Revenue, registering 0.4985 with a significant level of 5%, only after the number of guest rooms (Table 6). Total Franchise Expenses came in third place with regard to impacting Total Revenue, delivering a significant impact of 0.0943. Consistently this study shows that H$_0$, H$_{0a}$, and H$_{0c}$ are rejected (Table 6). Under the same fixed effects model estimation framework, Website Expenses did not show a significant impact on Total Revenue (Table 6). Consistent with findings from Table 5, Table 6 revealed similar results, offering empirical evidence against all null hypotheses. The magnitude of impacts also exhibited similar patterns as shown

in Table 5, with Total Labor Expenses in year t−1 delivering the second largest impact at 0.4955, significant at the 5% level.

Discussion and Implications

By extending Hua et al. (2015) and O'Neill et al. (2008), this study systematically examined the impacts of human capital, proxied by Total Labor Expenses at different lagged time points, on hotel operating performance, while controlling for a comprehensive array of potential confounding variables. This study offers a more holistic view of whether and how human capital influence hotel operating performance and sheds light on explaining the mixed results from prior research. The employment of the fixed effects model framework also enabled control for fixed effects variables such as chain scale and location.

Theoretical Implications

While more arguments and empirical studies advance our understanding of human capital (e.g.,

Table 5. *Fixed Effects Regression Analysis (Model 2)–EBITDA as the Dependent Variable*

Variable	Coef.	Std. Err.	t	P>t	95% Conf.	Interval
Total Labor Expenses$_{t-1}$	0.3988	0.0416	9.60	0.0000	0.3174	0.4803
Total Labor Expenses$_{t-2}$	−0.3339	0.0466	−7.16	0.0000	−0.4252	−0.2425
Total Labor Expenses$_{t-3}$	0.1005	0.0417	2.41	0.0160	0.0188	0.1823
Rooms	52,689	6,549	8.00	0.0000	39,850	65,528
IT System Expenses	1.6952	0.1681	10.08	0.0000	1.3656	2.0247
Website Expenses	0.0520	0.0357	1.46	0.1450	−0.0180	0.1220
Loyalty Program Expenses	2.8609	0.4024	7.11	0.0000	2.0720	3.6498
Total Franchise Expenses	1.7411	0.0927	18.78	0.0000	1.5593	1.9228
Advertising Expenses	0.5776	0.3549	1.63	0.1040	−0.1181	1.2733
_cons	−9,017,279	1,292,522	−6.98	0.0000	−11,600,000	−6,483,461

Note: R^2: within = 0.1266; between = 0.7611; overall = 0.7412.
$F_{(9,5875)}$ = 94.61; corr(u_i, Xb) = −0.9307; Prob > F = 0.000.
Number of obs = 7,355; Number of groups = 1,471; Group variable: PropertyID.

Table 6. *Fixed Effects Regression Analysis (Model 1)–Standardized Results with Total Revenue as the Dependent Variable*

Variable	Coef.	Std. Err.	t	P>t	95% Conf.	Interval
Total Labor Expenses$_{t-1}$	0.4985	0.0186	26.7700	0.0000	0.4620	0.5350
Total Labor Expenses$_{t-2}$	−0.0048	0.0204	−0.2400	0.8140	−0.0448	0.0352
Total Labor Expenses$_{t-3}$	0.0793	0.0178	4.4600	0.0000	0.0445	0.1142
Rooms	0.7763	0.0795	9.7700	0.0000	0.6205	0.9320
IT System Expenses	0.0445	0.0031	14.1800	0.0000	0.0384	0.0507
Website Expenses	0.0003	0.0006	0.4600	0.6460	−0.0009	0.0015
Loyalty Program Expenses	0.0559	0.0060	9.2800	0.0000	0.0441	0.0676
Total Franchise Expenses	0.0943	0.0031	30.3900	0.0000	0.0882	0.1004
Advertising Expenses	0.0198	0.0019	10.4400	0.0000	0.0161	0.0235
_cons	0.0184	0.0010	17.6900	0.0000	0.0163	0.0204

Note: R^2: within = 0.4726; between = 0.9501; overall = 0.9467.
$F_{(9,5875)}$ = 584.970; corr(u_i, Xb) = −0.8843 ; Prob > F = 0.000.
Number of obs = 7,355; Number of groups = 1,471; Group variable: PropertyID.

Table 7. *Fixed Effects Regression Analysis (Model 2)–Standardized Results with EBITDA as the Dependent Variable*

Variable	Coef.	Std. Err.	t	P>t	95% Conf.	Interval
Total Labor Expenses$_{t-1}$	0.4955	0.0516	9.6000	0.0000	0.3942	0.5967
Total Labor Expenses$_{t-2}$	−0.4054	0.0566	−7.1600	0.0000	−0.5164	−0.2944
Total Labor Expenses$_{t-3}$	0.1189	0.0493	2.4100	0.0160	0.0222	0.2156
Rooms	1.7725	0.2203	8.0500	0.0000	1.3406	2.2044
IT System Expenses	0.0879	0.0087	10.0800	0.0000	0.0708	0.1049
Website Expenses	0.0025	0.0017	1.4600	0.1450	−0.0009	0.0058
Loyalty Program Expenses	0.1186	0.0167	7.1100	0.0000	0.0859	0.1514
Total Franchise Expenses	0.1616	0.0086	18.7800	0.0000	0.1447	0.1784
Advertising Expenses	0.0086	0.0053	1.6300	0.1040	−0.0017	0.0189
_cons	0.0152	0.0029	5.2900	0.0000	0.0096	0.0209

Note: R^2: within = 0.1266; between = 0.7611; overall = 0.7412.
$F_{(9,5875)}$ = 94.61; corr(u_i, Xb) = −0.9307 ; Prob > F = 0.000.
Number of obs = 7,355; Number of groups = 1,471; Group variable: PropertyID.

Ooi et al., 2015; Úbeda-García et al., 2013), the fundamental apparatus through which human capital influences hotel performance has remained unclear (e.g., Domínguez-Falcón et al., 2016; Ooi et al., 2015). Given this study built on and extended Hua et al. (2015) and O'Neill et al. (2008), it provides a more holistic view of the fundamental mechanism through which human capital contributes to hotel operating performance. A reasonably comprehensive array of contextual variables based on prior studies, although not the foci of this study, played a critical role in testing the proposed hypotheses and helped offer sufficient power for modeling. In particular, this study reveals the impact differences of human capital at different lagged time points on both the top line and bottom line of hotels.

Empirically validating the proposed hypotheses and models with a large panel sample adds to the

theoretical development of the human capital utilization and effect literature, and separates this study from prior explorations that appear confined by data availability and potential sample biases (e.g., Luoh et al., 2014). As a result, this study can serve as a starting point for future studies to build on and expand to further our understanding of how the holistic conceptual framework that governs human capital impacts in the hotel context would work. In particular, empirical tests of all hypotheses yielded results that rejected the critical null hypothesis that human capital has no impact on hotel operating performance and elucidated the role that human capital plays at different time points in affecting hotel operating performance. With the unique and large dataset that arguably provided a representative sample of the U.S. hotel industry and the fixed effects estimation framework that accommodated the firm specific fixed effects such as location and chain scale, findings from this study can be reasonably interpreted to reflect the intrinsic relationships among the variables studied.

In addition, human capital literature remains inconclusive on how human capital as a capability influences firm performance (e.g., Domínguez-Falcón et al., 2016; Ooi et al., 2015) and, consequently, has initiated calls for more empirical studies to investigate the mechanisms through which firms can employ human capital for improved performance (e.g., Luoh et al., 2014). This study shows that the omitted variable problem is likely the critical reason that prior research found mixed results. On the one hand, prior studies may not have included as comprehensive an array of control variables as this study did. On the other hand, prior studies appear to focus on contemporaneous relationships and failed to address the lagged impacts of human capital. Either or both of these two issues would immediately lead to serious omitted variables problems and render all the coefficient estimates biased, resulting in potentially mixed results.

Last but not least, the lagged framework employed by this study avoided the simultaneity issues associated with the majority of prior studies addressing the relationship between human capital and firm performance (e.g., Domínguez-Falcón et al., 2016; Mitchell et al., 2013; Ooi et al., 2015; Razouk, 2011). Simultaneity issues arise when the independent and dependent variables are from the same time point

with possibilities of theoretically affecting each other. It is a big problem when the exploration is designed to establish casuality. For example, the classic criteria to establish causality dictates three sufficient conditions (Kenny, 1979): 1) One event precedes the other event; 2) Both events are correlated theoretically and empirically; 3) The relationship between the events are unlikely to be explained by alternative events. Consequently, failure to satisfy the first condition casts significant doubts on claims of establishing causality.

Managerial Implications

Since human capital plays a critical role in company success in the hospitality industry (e.g., Baum, 2015; Tracey, 2014), practitioners would find it beneficial to gain a deeper understanding of how human capital and labor costs impact hotel operating performance as measured by total revenue and EBITDA. In particular, the knowledge of the role labor costs play in the lagged timeframe would be helpful in easing the struggle to recruit and deploy human capital in hotel business processes. For example, prior research shows mixed results when exploring the relationships between human capital and hotel performance, which brought into question whether the overall costs associated with human capital are beneficial to hotel businesses (e.g., Lonial & Carter, 2015; Ooi et al., 2015). This study shows clearly that prior findings may be biased due to the omitted variable problem; in particular, the two-year lagged impacts of labor costs on hotel EBITDA appear to be significantly negative. Taking the analysis three years into the past, this study reveals consistent patterns that labor costs exhibit when exerting their impact on both top and bottom line items of total revenue and EBITDA. As a result, this finding can be beneficial for hotel managers when they are trying to make decisions to address turnover, recruitment, and training related issues. For example, it may be helpful to offer training programs to improve employee performance one year after the new recruitment since results of this study suggest that one year lagged labor costs exert the largest positive impact on hotel operating performance.

In addition, the control variables used in this study also reveal interesting results that could be useful for practitioners. It appears that IT system expenses,

loyalty program expenses, total franchise expenses, and advertising expenses have a significant and positive impact on hotel total revenue, while website expenses do not seem to play a significant role. In other words, costs associated with IT system, loyalty programs, franchising, and advertising appear to attract demand effectively. Further, IT system expenses, loyalty program expenses, and total franchise expenses deliver a significantly positive impact on EBITDA, with website expenses and advertising expenses playing an insignificant role with regards to EBITDA. As a result, expenses associated with IT systems, loyalty programs, and franchising appear to be instrumental in improving hotel profitability.

Limitations and Future Studies

Although this study shows a holistic framework to understand how human capital affects hotel operating performance, it does not reveal the set of practices leading to the study results. Therefore, a qualitative study would be valuable to uncover best practices and specific reasons that contribute to the different effects of lagged labor costs at different time points. Besides, the potential issue of generalizing the study results should be noticed. Although this study utilizes a large panel data sample, it is not generated randomly from the population. For future studies, different sources may be used to improve robustness of the study. For example, STR can be used to collect data to explore this topic. Lastly, the impacts of more detailed labor cost items can be explored when the data becomes available.

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