

Profitability in Egyptian hotels: business model and sustainability impact

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ABSTRACT: The goals of this research are: first, to identify factors impacting hotel profitability; second, to explore the profitability ratios most commonly used by Egyptian hotel managers; third, to examine whether the hotel profitability is considered an issue of control or not. Questionnaires were collected from a convenience sample of hotels at different locations in Egypt. Two-stage analysis was performed, involving the hotel profitability estimation in the first stage using a sophisticated frontier analysis technique (LIMDEP), and the determination of hotel profitability determinants during the second stage using regression analysis. Results showed that hotels' ability to succeed is not only determined by their business model attributes of size or location, but by their type, brand, and some controlled factors such as sustainability practices. The importance/performance analysis (IPA) showed that occupancy rate as a profitability indicator was situated in the second IPA quadrant, meaning similarity between importance and performance perceptions. Furthermore, measuring efficiency is a useful tool to identify factors impacting profitability. This research found that hotels located in the capital city do not show higher profitability values than hotels locating in remote areas. Hotels' size, capacity, star rating, type, managers' experience and sustainability factors were found to be the main profitability determinants. To date, this study is one of the first attempts to identify hotel profitability determinants in Egyptian hotels.

KEYWORDS: business model, Egyptian hotels, frontier technique, profitability, sustainability

Introduction

The service sector is a critical component in the majority of developed economies, it accounts for approximately 70 per cent of 2017's value added in the UK (Crespi, Criscuolo, Haskel, & Hawkes, 2006; Statista, 2018b). Similarly, it contributes around 55 per cent to Egyptian GDP growth (Statista, 2018a), while, 50 per cent of Egyptian employment benefit from the service organisations in general and nearly 2.5 per cent are engaged at hotels in particular. Although the service sector provides the most potential for improving profitability, the available profitability measures related to the relationship between outputs and inputs are still tricky and reflect a big challenge in which measure to consider (Zaki, Jones, Morsy, & Abdelmabood, 2013).

Proof from various research studies suggests that hotels' profitability is, to a large extent, affected by many factors, either controlled or beyond management control. This article questions this suspicion by testing the relationship between hotel business model variables, sustainable practices and hotel profitability using a financial data set.

It has been argued that profitability is one of the main pillars for any hotel to survive in the long run. Even though profitability is a prime goal for all business leaders, it is suggested that insufficient attention has been paid to exploring drivers of profitability, especially in developing countries (Alarussi & Alhaderi, 2018). Therefore, the novelty of this empirical study consists of the inclusion of both controlled and uncontrolled determinants of hotel profitability.

According to Angeles Montoro-Sánchez, Mas-Verdu, and Ribeiro Soriano (2008), there is no proper unit of analysis for elucidating the profitability concept, as typically pointed out in the debate between economics and management disciplines in the literature. The quality and efficiency of hotel managers rely on their ability to identify those factors that can lead to profitability control. Generally, profitability could be defined as the earnings of the company that are generated from revenue after subtracting all related expenses incurred during a certain period. It is one of the most important distinguishing factors that refer to management success, customer satisfaction, the attraction of corporate investors and company sustainability. Undoubtedly, the ultimate goal of any organisation is to maximise the shareholder's portion by increasing profit from the used resources. Future extrapolations signpost that hotel profitability drivers will come to be even more of a challenge, with a subsequent effect on hotel management (Burgess, 2007).

One of the most important inquiries widely considered in literature is the reason behind the change in the pattern of profitability over time. Nanda and Panda (2018) observed the influence of the exogenous (macro-economic) and endogenous (firm-specific variables) determinants on profitability. They concluded in their Indian empirical research that the firm-specific factors and exchange rate channels are quite relevant in elucidating the profitability. Assaf, Josiassen, Knežević Cvelbar, and Woo (2015) reported that the financial measures of profitability are best measured using the technical efficiency gap

matrix which involves a small number of used inputs to generate many outputs.

Recently, Bodhanwala and Bodhanwala (2018) revealed a significant positive relationship between sustainable factors and some profitability measures (return on invested capital, return on equity, return on assets and earnings per share). They suggested that organisations which practise remarkable sustainable strategies ensure profitability and have substantially lower carbon footprints.

The main aim of this research is to re-test the relationship between hotel business model variables, sustainable orientation factors, and hotel profitability in Egypt. The research is conducted as follows. First, there is the literature review in which we discuss the profitability concept in the hotel industry. This is followed by the profitability measurement issues, both in general terms and specifically within the hotel context. The research methodology is then presented. Next, the results are discussed, and implications for further research are then reported.

Review of related literature

The literature shows two main related themes, to be discussed below as follows: profitability research in the hotel industry and the profitability determinants debate. Finally, the proposed framework is highlighted.

Profitability research in the hotel industry

The prime objective of a profit-seeking company is to maximise profitability. A business needs to make a profit to be able to offer a return for any investors and to be able to grow the business by re-investment (Parsons, 2002). The critical performance measure for any private business is profitability. Without ongoing profitability, a business is simply eroding its stock base. Because of its importance, profitability concepts are employed in many areas of business research. For instance, they are employed in many hospitality research studies (Sandvik, Duhan, & Sandvik, 2014; Bougatef, 2017; Menicucci, 2018). In addition, profitability definitions may be expressed in absolute terms (financial profits) or in comparisons and ratios. For example, profitability might be compared to active costs (gross operating profit, net margins) to specific activities within the hotel (return on sales [ROS], return on investments [ROI], return on assets [ROA], and return on other aspects of the business), to the capital provided to the organisation (return on equity, assets, debt, total investments), to stock prices across time, or to factors in the business environment such as profits before or after taxes, profits relative to competitors, or profits relative to industry averages. Sandvik et al. (2014) defined profitability as the ratio of returns to identifiable assets and sales.

Notably, financial ratios have always been a valuable tool for service industry managers. Ratios allow the user to summarise and analyse related data to provide meaningful information for making decisions (Singh & Schmidgall, 2002). Most of the financial ratios exist to help hotel executives to review and investigate the financial and operating data that appears in the corporate financial statements. The financial ratios are of five types (liquidity, operating, solvency, activity, and profitability). The liquidity ratios are used to show the ability of an organisation to meet short-term responsibilities. The operating ratios refer to management efficiency regarding its operations. The solvency ratios are used to show the ability of an organisation

to pay long-term financial obligations. The activity ratios are to measure management efficiency regarding its assets. The profitability ratios highlight the management return on sales and investments. Most of the previous ratio studies have focused on the definition, adoption, interpretation, measurement, and benchmarks of performance and ratio usage between different groups (Xiao, O'Neill, & Mattila, 2012).

Profitability is considered a multidimensional concept in many financial measures such as return on equity, return on assets, occupancy rate, and gross operating profit per available room. The hotel industry calculates its achievement and excellence not only with bottom-line financial ratios like gross operating profit (GOP) or net operating income (NOI), but also with top-line financial indicators, such as the average daily rate (ADR) and revenue per available room (RevPar). ADR is measured by taking the total amount of revenue earned in one night and dividing it by the total number of sold rooms. RevPar is measured by taking overall revenue from accommodation and dividing it by the total number of vacant rooms in the hotel. These two ratios are considered by hotel managers to be the most crucial operating indicators when defining the profitability of a hotel. Furthermore, the industry uses occupancy as a financial indicator (O'Neill, Sohal & Teng, 2016). Occupancy is calculated by taking the total number of sold rooms and dividing it by the total number of available rooms in any hotel. In general terms, this percentage is discussed and used as a comparison tool against other hotels in the market, but it only identifies the actual demand. The goal of any hotel is to operate with full occupancy percentages to achieve better financial outcomes (Matovic, 2002). Wadongo, Odhuno, Kambona, and Othuon (2010) reported that hotel profit maximisation is one of the most important key performance indicators (KPIs) in the Kenyan hotel industry. They further confirmed hospitality managers in Kenya are still primarily focusing on financial measures of performance.

Hotel profitability determinants

Sainaghi, Baggio, Phillips and Mauri (2018) used network analysis in their research of the hotel financial performance indicators in the hospitality and tourism research domain to examine two research questions.

The first question relates to ascertaining general trends from the hotel performance literature, and the second focuses on identifying the salient streams and sub-topics. The analysis embraced 20 years (1996–2015). The sample included 1 155 papers. For the analysis, they created a network of papers designated as nodes and the citations among the papers as links. They found 761 papers that were "connected" studies within the network. By contrast, 34 per cent of the sample (394 papers) consists of "unconnected" studies. Excluding outliers, the net sample was 734 articles. They identified 14 clusters, which they broke down into several sub-topics. They provided some conclusions regarding trends and future research directions. With regard to salient topics, cross-citation and network analysis provide a detailed picture of where the literature comes from and where it currently stands.

O'Neill and Mattila (2006) in their research in US hotels found that hotel profit is highly correlated with size, market segment, and occupancy percentages. A follow-up study in Malaysia (Alarussi & Alhaderi, 2018) confirmed the correlation between organisation size and profitability. Nanda and Panda (2018) differentiated the profitability determinants into two

main factors, i.e. internal, and external factors. The internal factors include the business model variables, while the external profitability factors are the macro-economic determinants in Indian companies.

Menicucci (2018) examined profitability and its determinants using a sample of 2 366 Italian hotels from a panel data set from 2008 to 2016. He applied a composed measure of profitability comprising return on equity, return on assets, occupancy rate and gross operating profit per available room, and he investigated the variables affecting profitability and put them into five main groups: market variables, business model, ownership structure, management education, and control variables. Menicucci (2018) found that a financial crisis, business model factors, and ownership structure affect hotel profitability.

However, there is another stream of research which identified other factors affecting profitability such as the innovation and competitive market advantage in the Norwegian hotels (Sandvik et al., 2014). Bougatef (2017) has drawn researchers' attention to the effect of the corruption level on banks' profitability in Tunisia.

The ability to clearly formulate and execute a logical strategy is crucial to survive in the hotel industry. Previous literature focused on the relationship between hotels' strategy and profitability. The strategic decisions regarding hotel situation, size, chain affiliations, age, and brand are the main uncontrolled profitability determinants (O'Neill & Mattila, 2006; Xiao et al., 2012; Assaf & Tsionas, 2018). Most of them demonstrated a positive relationship between business model factors and hotel profitability.

The previous literature guided us to the first hypothesis, which is:

- Hypothesis 1: Hotel business model variables positively influence profitability.
 - Hypothesis 1a: Hotel location positively influences profitability;
 - Hypothesis 1b: Hotel size positively influences profitability;
 - Hypothesis 1c: Hotel age positively influences profitability;
 - Hypothesis 1d: Hotel brand positively influences profitability.

Recently, research on the effect of sustainable orientation on profitability is imperative, as recommended by Bodhanwala and Bodhanwala (2018). Sustainability incorporates many businesses, economic and social implications (Legrand, Sloan, & Chen, 2017). The most agreed upon sustainability practices introduced in this study can help hotel managers and their operations become more operationally sustainable. Bai and Sarkis (2014) introduced a methodology to identify sustainable KPIs that can then be used for sustainability performance evaluation. It was based on using the data envelopment analysis (DEA) to benchmark and evaluate relative performance.

Since the research conceptual framework (Figure 1) and hypotheses are based on the resources-based theory (Barney, 1991), it led us to the second hypothesis which is:

- Hypothesis 2: Hotel's sustainable orientation variables positively influence profitability.

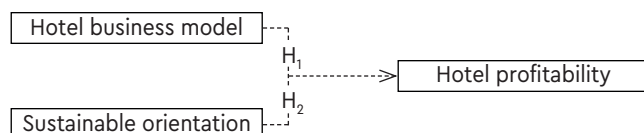


FIGURE 1: Hotel profitability framework

- Hypothesis 2a: Energy management positively influences profitability;
- Hypothesis 2b: Waste management positively influences profitability;
- Hypothesis 2c: Water management positively influences profitability.

The aforementioned sustainability practices are modified from Azapagic and Perdan (2000) and Zaki (2017).

Research methodology

Evidence from various research suggested that hotels' profitability is to a great extent driven by many factors, either controlled or beyond the control of the management. This article questions this suspicion by testing the relationship between some hotel business model variables, sustainable orientation factors and hotel profitability using a cross-sectional data set of 31 hotels in Egypt. Furthermore, we extended the examination of profitability indicators using the importance/performance matrix ranking across different hotel companies. Hence, two main objectives for this research are subject to investigation: first, to analyse differences in importance/performance (usage) of the profitability ratios most commonly used by Egyptian hotel managers; second, to examine whether the hotel business model characteristics and sustainability practices affect hotel profitability.

The current study adopted a quantitative approach using the interviewer-completed questionnaire (ICQ) strategy as a method for data collection to answer the research question and to achieve the aim and objectives. The methodology designed for the current research was guided by the primary research question and the subsequent research objectives. Descriptive research describes and defines a phenomenon as it exists. It is used to identify and obtain information on the characteristics of a specific problem (Crotty, 2003).

Research data were collected through two methods of data collection: first, secondary methods through searching in several database sources were used to get the financial hotel data from hotel companies listed in the Egyptian Bursa database; second, using a questionnaire that was developed on the basis of the reviewed literature and the pilot study to quantify, supplement and complement the research's main concern.

The final questionnaire draft involved five sections of 46 survey-coded variables. The first part contains a cover letter to explain the purpose of the study, contact information, and general directions. The second part aimed to collect data about the hotel, asking them to record the business model variables (hotel name, location, size, total staff capacity, and brand). The demographic profile of respondents then followed using four closed questions. The third part aimed to measure the perception of hotel managers to the profitability indicators according to the importance/performance analysis (IPA) matrix evaluations.

It was also noted that the majority of hotel managers were unwilling to share and disclose their financial data. However, we included the financial data from other sources such as the financial statements, income statements, and balance sheets obtained from each company website and from the Egyptian Bursa database.

The final part aimed to ask hotel managers to what extent they use some sustainable indicators of energy, water, and waste practices in the hotel operations. The final part listed

five indicators related to the use of energy management practices, six indicators related to the use of water consumption management practices, and eight items related to the use of waste handling management practices, to be assessed based on their actual usage levels. A five-point Likert scale type was used: "5 = strongly used" and "1 = strongly not used".

The target population of the current study was the hotel managers working in Egyptian hotels in four cities in Egypt, e Cairo, Giza, Fayoum, and Hurghada. The main reason for selecting these four cities is related to accessibility and the time limitation using convenience sampling to achieve the predetermined objectives. The sample frame size selected was 31 hotels, as seen in Table 1.

A total of 31 questionnaires were distributed to the managers of the sampled hotels. From the sample, 31 questionnaires were fully returned, a response rate of 100% (Table 2).

Mixed methods of data analysis were performed. The collected data were processed and analysed through some statistical tests using two statistical programs. The descriptive analysis was performed using SPSS Vers. 24 (e.g. frequencies, percentage, independent and paired sample *t*-test, Cronbach's alpha, regression; Field, 2013).

The second program was LIMDEP Ver. 11, recommended by Zaki (2014) to calculate hotel profitability using a mix of financial input/output measures. LIMDEP is one of the econometric and statistical software packages with a diversity of estimation tools. In addition to the core econometric tools for analysis of cross sections and time series, LIMDEP supports methods for frontier and efficiency calculations.

Results and discussion

Profitability calculations

Once the main hotel data was obtained, it was entered into the LIMDEP software to calculate the technical efficiency gap (Mhlanga, 2018) to reveal the best performing hotel in the sample. Therefore, hotels which get the frontier (1.0) are considered the more profitable hotels compared to others.

As shown in Table 3, four hotels (namely 14, 21, 24, and 27) emerged as on the technical and cost efficiency frontier, with hotel 23 having the second highest efficiency (0.98) scores. Hotel 12 and hotel 25 emerged in third place with (0.97) scores. To understand the dynamics underlying these scores and the profitability determining factors, the results from the second-stage analysis are discussed in the regression results section. Table 3 lists the descriptive statistics for the hotel sample.

In relation to categorising the similarities and differences between the importance and actual usage level of each profitability measure, the normality test showed that data has the parametric test requirements. Thus, the paired sample *t*-test

was employed to determine such similarities and differences. The results are shown in Table 4.

The possible range of importance/actual usage levels started from 1.0 and went up to 5.0, with 1.0 being the least important, and 5.0 the most important on the scale, and 1 indicated that it rarely used, and 5 highly used on the performance scale. Thus, the scale length is 5.0, and the central point on this scale is 2.5. Thus, the measure was considered "highly important" or had "high performance" if it was given importance or performance score means that exceed 2.5. Otherwise, it was considered "low important" or "low performance". Importance and performance data of profitability measures were plotted on two axes, with importance on the Y-axis and performance on the X-axis. The Y-axis reports the assessed profitability measures, and the X-axis shows the performance in relation to these measures.

The IPA matrix (Figure 2) includes four quadrants. Each quadrant involves a different management approach. Based on IPA positioning, hotel managers can determine which

TABLE 2: Descriptive statistics

Variable	Frequency	%
Sex		
Male	26	83.9
Female	5	16.1
Age		
21-30	4	12.9
31-40	16	51.6
41-50	8	25.8
Above 51	3	9.7
Hotel manager	8	25.8
Executives	23	74.2
Experience		
Less than 1 year	1	3.2
1-5 years	2	6.5
6-10 years	2	6.5
11 years and more	26	83.9
Hotels characteristics		
Location		
Cairo/Alex road	8	25.8
Cairo	8	25.8
Fayoum	2	6.5
Giza	10	32.3
Hurghada	3	9.7
Size		
1-50 room	1	3.2
51-200	9	29.0
201-400	14	45.2
401-600	2	6.5
>600	5	16.1
Age		
1900-2000	21	67.7
2001-2018	10	32.3
Number of employees		
<100	5	16.1
101-300	21	67.7
301-500	5	16.1
Star		
3 star	1	3.2
4 star	14	45.2
5 star	16	51.6
Type		
Independent	10	32.3
Chain	21	67.7
Total	31	100.0

TABLE 1: Hotels sampled and their classifications

Hotel sample	Hotel classifications			Total
	5 star	4 star	3 star	
Cairo	7	8	1	16
Giza	5	5	0	10
Hurghada	3	0	0	3
Fayoum	1	1	0	2
Total	16	14	1	31

profitability indicator should command more attention. The four identifiable quadrants are: concentrate here, keep up the good work, low priority, and possible overkill.

According to the occupancy rate, this measure was assessed by managers to be of high importance, and at the same time, to have high levels of performance. The message here is to keep up the good work. However, three profitability indicators (cost

targeting, ROE, ROA) have been seen to be of low performance. Accordingly, hotel managers should consider them.

Table 5 shows differences in profitability between the hotel clusters classified by the independent variables. The independent samples *t*-test is mostly valuable in measuring differences between two independent groups. It detects statistically significant differences in the mean of profitability

TABLE 3: Profitability calculations using LIMDEP

Stoc. Frontier normal/truncated-normal model					Number of obs: 31	
Log likelihood = -84.085517					Wald χ^2 (3): 3.57e+07	
					Prob > χ^2 = 0.000	
Output	Coefficient	Standard error	z	p > z	95% CI	
Occupancy	0.0070497	0.0027	3.56	0.010	0.0016523	0.01244
REVPAR	0.0006209	0.00020	3.06	0.002	-0.0010189	-0.0022
ROE	0.0000146	0.00002	0.52	0.600	-0.000399	0.00006
-cons	91.44586					
Code	Output	No. of rooms	REVPAR	ROE	Max_output	Efficiency
1	75	280	26 224	201 062	80.68	0.93
2	77	320	21 456	113 389	84.13	0.92
3	80	286	26 224	190 080	86.75	0.92
4	70	400	26 224	177 408	83.32	0.84
5	71	560	21 456	144 288	84.37	0.84
6	72	283	21 456	135 993	83.15	0.87
7	75	279	23 840	172 800	84.2	0.89
8	74	298	21 456	155 520	82.8	0.89
9	80	290	26 542	200 000	84.93	0.94
10	69	293	25 654	201 111	84.74	0.81
11	80	297	24 857	180 000	84.43	0.95
12	81	310	22 555	170 000	83.44	0.97
13	83	301	21 000	199 999	86.89	0.96
14	85	300	22 100	165 849	85	1.00
15	79	298	22 456	125 478	85.37	0.93
16	79	68	22 478	132 654	85.76	0.92
17	78	680	22 450	210 101	87.54	0.89
18	80	670	21 589	201 000	89.43	0.89
19	78	675	26 224	184 564	82.01	0.95
20	80	700	21 456	154 658	86.72	0.92
21	88	780	21 456	200 100	88	1.00
22	83	140	23 840	168 999	86.05	0.96
23	84	145	21 456	186 974	85.5	0.98
24	82	142	26 224	135 698	82	1.00
25	81	146	22 555	170 000	83.44	0.97
26	83	150	21 000	199 999	86.89	0.96
27	85	442	22 100	165 849	85	1.00
28	79	86	22 456	125 478	85.37	0.93
29	79	65	22 478	132 654	85.76	0.92
30	78	15	22 450	210 101	87.54	0.89
31	80	52	21 589	201 000	89.43	0.89

TABLE 4: Paired sample t-test

Profitability measures	Importance mean	Actual usage mean	t-test result (sig. p-value)	Decision (similar/gap)
P1 Total sales	4.90	4.10	<0.001	Gap
P2 Revenue per available room	4.94	4.03	<0.001	Gap
P3 Total revenue	4.87	4.03	<0.001	Gap
P4 Cost targeting	4.74	2.29	<0.001	Gap
P5 Return on equity	4.90	2.35	<0.001	Gap
P6 Return on assets	4.97	2.42	<0.001	Gap
P7 Occupancy rate	4.84	4.87	0.325	Similar

$p < 0.05$: shows similarity between the importance and actual usage level of the profitability measures

$p \leq 0.05$: shows the significant difference between the importance and actual usage level of the profitability measures

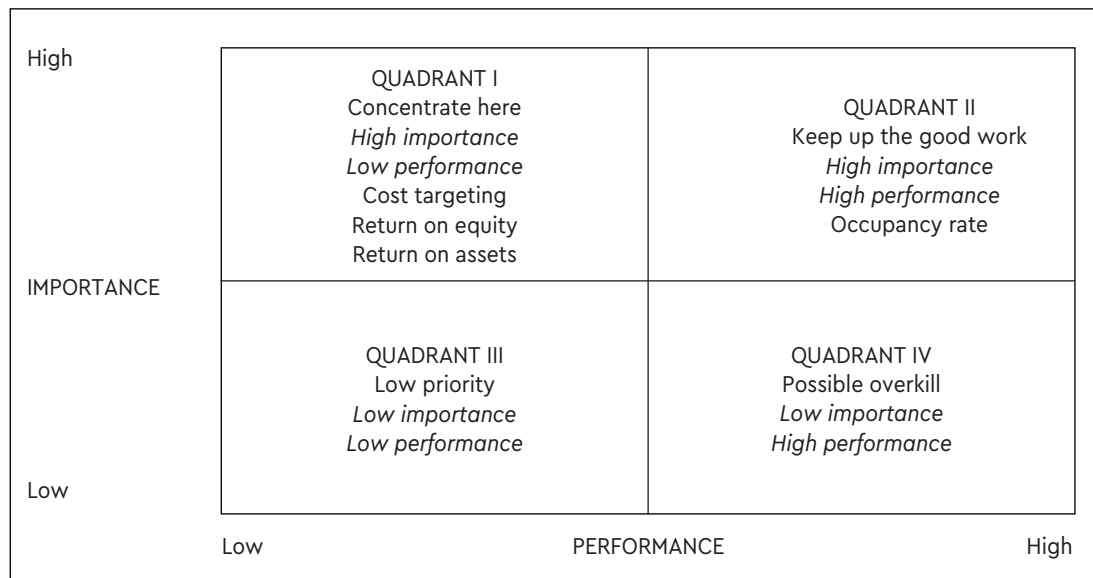


FIGURE 2: IPA matrix of profitability measures

TABLE 5: Independent samples t-test for profitability differences

	Levene's test for equality of variances		t-test for equality of means				
	F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Standard error difference
Hlocation	1.503	0.230	-0.303	29	0.764	-0.177	0.584
Hsize	0.000	0.997	-4.573	29	0.000	-1.869	0.409
Hage	83.154	0.000	1.710	29	0.098	0.385	0.225
Noemployees	0.001	0.972	-4.230	29	0.000	-0.954	0.226
Star	29.861	0.000	-2.377	29	0.024	-0.615	0.259
Htype	83.154	0.000	-1.710	29	0.001	-0.385	0.225
Age	0.035	0.852	0.354	29	0.726	0.146	0.412
level	0.477	0.495	-0.314	29	0.756	-0.069	0.221
Experience	4.903	0.035	-0.958	29	0.006	-0.346	0.361
Energy	0.640	0.430	-0.593	29	0.558	-0.18308	0.30855
Water	4.400	0.045	-1.496	29	0.014	-0.57821	0.38647
Waste	0.626	0.435	-4.284	29	0.000	-1.42500	0.33264
Profitability	2.267	0.143	0.527	29	0.602	0.01285	0.02436

measures, confirming the null hypothesis as two populations share the same distribution in the dependent variable.

Table 5 reveals statistically significant ($p < 0.05$) differences in the profitability variable according to the hotel's size, capacity, star rating, type, managers' experience, water, and waste factors. Specifically, we observed variations between large and small hotels, hotels with a lot of staff and those who have fewer numbers of employees, hotels with 5, 4 and 3-stars, and chain-affiliated and individual hotels. However, hotels located in the capital city do not show higher profitability values than hotels located in remote areas. These findings deviate from the findings by Menicucci (2018), who found that hotels situated in urban locations in Italy are more profitable than hotels situated in coastal locations. Consequently, the hotel location does not appear to ensure high profits. Interestingly, hotels operating under general managers with a high level of experience show higher profitability values than hotels operating under less-experienced managers. The coefficients are statistically significant (0.006). This result supports Menicucci (2018), who found that well-educated hotel managers contribute to higher levels of profitability.

It is also noted that hotels approaching the sustainable practices of water conservation and waste management show higher profitability values than hotels that do not consider these approaches. The coefficients are statistically significant ($p < 0.05$). These findings support prior studies verifying that high performance in hotels or hospitality organisations is directly related to sustainability-based practices (Peng Xu, Chan, & Qian, 2012; Rowe, 2018). The same can be said for manufacturing companies (Bodhanwala & Bodhanwala, 2018).

Correlation test

To understand the nature of the relationships between the variables considered to influence profitability, the correlation test was applied to the data to determine the strengths of the relationships. Table 6 shows how hotel location, hotel age, capacity (number of employees), type, and water variables positively affect profitability. While hotel size, star rating, energy, and waste factors negatively affect profitability. As with the case of multicollinearity, Myers and Myers (1990) indicated that the variance inflation factor (VIF) value of more than 10 is

problematic. Consequently, the VIF values reported for this study are acceptable and are lower than 3. Moreover, the tolerance values were greater than 0.1. Therefore, multicollinearity is not a concern for this further analysis.

Regression results

To test the theoretical framework and the corresponding hypotheses, a regression analysis was performed, and the results are presented in Table 6 and Figure 3.

Table 7 and Figure 3 show that only two business model factors (namely star rating and type) significantly impact ($p < 0.05$) (at 5% level) hotel profitability. The coefficients for star-rating categorisation and hotel type are statistically significant and positive ($p < 0.05$). The results deviate from the findings by Menicucci (2018), who confirmed the significant positive effect of hotel size, age, and location on profitability. Consequently, this study partially answers the first proposition, as hotel business model variables positively influence profitability. Findings show that sustainable orientations have a significant positive effect on hotel profitability. Hence the second proposition

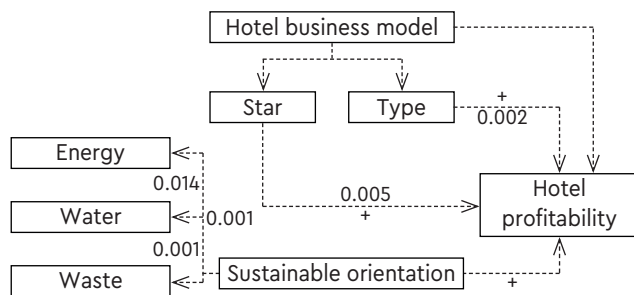


FIGURE 3: Hotel profitability tested model

TABLE 6: Correlation matrix

	Hlocation	Hsize	Hage	No employees	Star	Htype	Energy	Water	Waste	Profitability
Hlocation	1	-0.169	0.524**	-0.196	0.061	0.150	0.059	0.280	-0.032	0.261
Hsize	-0.169	1	-0.506**	0.556**	0.461**	0.216	0.276	0.151	0.488**	-0.061
Hage	0.624**	-0.606**	1	-0.607**	-0.226	0.181	-0.030	0.175	-0.117	0.245
No employees	-0.196	0.556**	-0.507**	1	0.304	0.243	0.166	0.012	0.396*	0.117
Star	0.061	0.461**	-0.226	0.304	1	0.506**	0.290	0.507**	0.505**	-0.263
Htype	0.150	0.216	0.181	0.243	0.596**	1	0.344	0.433*	0.557**	0.011
Energy	0.059	0.276	-0.030	0.166	0.290	0.344	1	0.246	0.284	-0.036
Water	0.280	0.151	0.175	0.012	0.587**	0.433*	0.246	1	0.413**	0.113
Waste	-0.032	0.488**	-0.117	0.396*	0.525**	0.557**	0.284	0.613**	1	-0.212
Profitability	0.261	-0.061	0.245	0.117	-0.263	0.011	-0.036	0.113	-0.212	1

**Correlation is significant at the 0.01 level (2-tailed); *Correlation is significant at the 0.05 level (2-tailed)

TABLE 7: Regression analysis

Model		Unstandardised coefficients		Standardised coefficients		t	Sig.
		B	Std. Error	Beta			
1	(Constant)	0.967	0.112			8.641	0.000
	Hlocation	0.000	0.009	0.004		0.020	0.984
	Hsize	0.000	0.000	-0.565		-1.038	0.310
	Hage	0.000	0.001	-0.066		-0.305	0.763
	No employees	0.000	0.000	1.073		2.032	0.044
	Star	-0.072	0.020	-0.835		-3.539	0.002
	Htype	0.076	0.024	0.734		3.112	0.005
	Energy	-0.006	0.013	-0.081		-0.512	0.014
	Water	0.053	0.014	0.866		3.871	0.001
	Waste	-0.052	0.014	-0.909		-3.695	0.001

was fully accepted as the coefficients for energy saving, water consumption, and waste management practices are statistically significant and positive ($p < 0.05$). The results support previous studies (Peng Xu et al., 2012; Rowe, 2018).

Conclusions and practical implications

Evidence from previous research suggest that hotel profitability is, to a great extent, affected by many factors either controlled or beyond the control of the management. Therefore, this article questions this suspicion by testing the relationship between hotel business model variables (size, location, type, and brand), sustainability factors and hotel profitability at 31 Egyptian hotels. The research aimed to analyse differences in importance/performance of the profitability ratios most commonly used by Egyptian hotel managers. Furthermore, it proposes to examine whether hotel profitability is driven by management-controlled factors or not.

Primary and secondary data were collected using the financial hotel data and the questionnaire strategy. The financial hotel data have helped the calculation of hotel profitability. A profitability measure was obtained using the frontier analysis of LIMDEP software. Then, the relationship between hotel profitability (a dependent variable) and the profitability determinates (independent variables) was subject to testing through regression analysis.

The IPA results show that occupancy rate as a critical profitability measure is situated in the second IPA quadrant, which means there is a similarity between importance and performance perceptions. However, gaps were highlighted in relation to other profitability measures.

Moreover, the results revealed that hotel brand and star rating categories influence hotel profitability positively. Interestingly,

the hotel which practises sustainability efforts reported higher profitability scores than others.

The theoretical contributions of this study reveal that hotel profitability, according to this empirical data and regression outcome, is a matter of control. The study found some variations between large and small hotels, hotels of many staff and those who have smaller numbers of employees, hotels ranked 5, 4 and 3-star, chain-affiliated and individual hotels. However, hotels located in the capital do not show higher profitability values than hotels located in remote areas. Generally, a hotel's size, capacity, star rating, type, managers' experience, energy, water, and waste factors were found to be the main profitability determinants.

We could conclude that this article differs from previous studies in many ways: first, it focuses on financial data in Egypt to calculate the actual efficiency score using a unique frontier technique. Previous studies have concentrated on other proxies for efficiency. Second, this study analyses the relationship between the most well-known firm-related factors (hotel business model) and three other independent factors of sustainability and profitability as a dependent variable.

The results further offer some new evidence to a sample from the Egyptian hotel sector and note the importance of examining several firm-specific factors to measure hotel profitability. Few empirical studies have inspected the performance in developing countries, or Egyptian hotels industry so far, and no study in such a context has investigated the influence of the sustainability orientation and business model impact on hotel profitability. Therefore, our research attempts to fill a gap that remains an open question in the existing literature as prior studies used a limited number of controlled variables to search for a relationship with efficiency and profitability.

The major limitation of this research is the availability of profitability data from hoteliers. Most hotel managers do not like to share their financial outcomes. That was why only 31 hotels agreed to participate in this study. Future research may consider this issue to find out alternatives to the financial data. The small sample here is considered a constraint to generalisability considerations. Therefore, future research should consider a large sample with longitudinal data. Finally, this article recommends the use of a variety of profitability measures for the hotel owners, and sends a message to hotel managers to practise sustainability such as energy-saving, water conservation, and waste handling.

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