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Efficiency and Effectiveness of Marketing of the Hotels in Kuala Lumpur

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ABSTRACT

This study employs a separate two-stage DEA model to measure marketing efficiency and marketing effectiveness of three- to five-star hotels in Kuala Lumpur for the period between 2004 and 2010. The results indicate those hotels with lower number of stars face less technical problems in transforming the marketing inputs to the utilized service capacity, namely the occupied rooms. However, the hotels, particularly the lower star-ranking ones have considerable managerial problems in transforming the utilized service capacity into profit. Finally based on the slack analysis, the necessary improvements of the marketing factors and profit are presented in order to catch up with the efficient frontier.

Keywords: Data Envelopment Analysis (DEA); Marketing Efficiency; Marketing Effectiveness; Occupancy Rate; Star Ranking.

INTRODUCTION

The increasing amount of competition in the economy over the past few years has attracted the interest of researchers in the measurement and analysis of efficiency in all economic sectors. Given the global scope of today's tourism, the tourism industry makes a high contribution to the economy by generating foreign exchange income. The tourism industry, as the second largest foreign exchange earner in Malaysia (Tourism-Malaysia, 2009), is one out of eight industries that aims at further development by enhancing efficiency in the production process and the efficient utilization of assets (IMP3-Malaysia, 2006-2020; Ninth-Malaysian-Plan, 2005-2010). Among the different subsectors of this industry, the hotel sector receives, on average, 31 per cent of the travel expenditure of tourists (Tourism-Malaysia, 2009). It makes a high contribution to the revenue of the tourism industry. However,

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average occupancy rate of hotels in Malaysia and Kuala Lumpur has only been 62 and 65 per cent respectively, between 2003 and 2012. This shows that there is a rather large idle capacity compared with some other countries in the region such as Singapore (82 per cent) and Hong Kong (78 per cent) (Tourism-Malaysia data;(CBRE, 2012). The idle capacity results in the loss of potential revenue (Knowles, 1998) and consequently the inefficiency of the industry. Based on Van Dyke (1985), long-lasting inefficiency in renting the rooms can result in low profit level of a hotel that can also lead to an immediate exit of the market. Therefore, the hoteliers should upgrade their efficiency level in order to remain competitive and to survive the market.

To increase the profit, a firm has to increase revenues and decrease costs. In the case of hotels, fixed costs are high; thus, the marginal cost for offering an additional service is relatively low compared to the existing available capacity. Henceforth, hotel managers should focus on attracting more customers and increasing occupancy rates. Occupancy rate representing the ability of hotel management to attract guests is a measure that has traditionally been used to judge hotel performance. Due to the substantial fixed costs of hotel operation and perishability of hotel services, the profit level of a hotel is greatly tied to occupancy rate (Allen, 1988), and occupancy rate is highly influenced by marketing activities. Since the fixed costs of hotels such as rental and utilities are rather inflexible, marketing expense is usually among the first costs selected to be cut down (Weber, 2002).

Like most firms, service companies spend large amounts of money on marketing activities, including promotion and sales. Effective marketing enables a firm to attract and retain buyers which can lead to higher profitability level (Lovelock, 2001). In the case of hotel companies, besides the perishable characteristics of the hotel services, hoteliers face uncertain demand for their services (Baum & Haveman, 1997) due to the effect of uncontrollable factors such as consumer preferences, degree of competition, and frequent uncertainties such as global slowdown (between 2007 to 2009), in the business environment of the industry. Therefore, hoteliers will have to focus their attention on improving marketing technology in order to coordinate demand and supply efficiently. Hence, improvements in marketing activities could lead to higher occupancy rate and consequently higher profit.

Therefore, the objective of this study is to measure and analyse marketing efficiency to find out how well the marketing inputs are transformed into occupancy rate, and also marketing effectiveness to look at how well the profit is transformed from the occupancy rate. This analysis is conducted based on three critical factors in a hotel operation, namely; marketing expenses, occupancy rate, and profit.

The study is organized as follows; the first section of the paper provides the introduction, while the second section is the literature review. The methodology

is addressed in the third section, and the empirical results and discussions of the study are in the fourth section. Finally, the fifth section presents the conclusions and recommendations.

LITERATURE REVIEW

Based on the Structure-Conduct-Performance (SCP) theory of industrial organization, developed by Mason (1939) and Bain (1956), the performance of an industry is determined by its structure and the conduct of its firms. In recent years, along with the rapid globalization and competition process, hotel efficiency analysis has attracted the attention of many scholars because it reveals how well the resources are being managed by the hoteliers (e.g. Huang, Mesak, Hsu, & Qu, 2012; Yu & Lee, 2009). Farrell (1957) developed a single input-output efficiency measure based on a production possibility set to identify an efficient frontier. Over the past fifty years, different functional forms and measurement techniques have been applied to either estimate or calculate efficient frontiers (Murillo-Zamorano, 2004). Following Farrell (1957), Charnes, Cooper and Rhodes (1978) generalized the single input-output efficiency measure of Farrell to the multiple input-output measure and introduced the term Data Envelopment Analysis (DEA) to describe a mathematical programming approach for the construction of production frontiers and the measurement of firms efficiency. Their model uses the constant return to scale (CRS) assumption. Banker, Charnes and Cooper (1984) extended the DEA model under CRS by considering the variable returns to scale (VRS) technology. The conventional DEA models (i.e. CRS DEA and VRS DEA) are frequently employed to analyse the efficiency of the hotel industry. As such, many studies, such as Chiang, Tsai, and Wang (2004), Barros (2005), Sanjeev (2007), Barros and Dieke (2008), and Barros, Botti, Peypoch, and Solonandrasana (2009) employed the DEA-CRS or DEA-VRS approach. Pulina, Detotto, and Paba (2010), and Huang et al. (2012) also evaluated the efficiency of hotels via a conventional DEA model and use the panel estimation approach in order to provide a comparison of a hotel with respect to its own performance over time. All the above mentioned studies have applied a conventional DEA model to evaluate the overall performance of hotels. This has provided one shortcoming however, where efforts of different processes in hotels and the effect of their performance on overall performance are ignored.

A few latest studies have used multistage DEA models to build a better understanding of the relationship between efficiency and effectiveness (Chiu & Huang,(2011). To be more specific, multistage DEA models help researchers to evaluate both efficiency of a single process in a production unit and the effect of its performance on the overall performance. These studies can be divided into

two categories in terms of the model employed. Firstly, there is the separate two-stage DEA model which uses an input-oriented DEA model in the first stage to measure efficiency, and an output-oriented DEA model in the second stage to evaluate effectiveness. In this model, outputs of the first stage are considered as the inputs of the second stage. Secondly, the integrated two-stage DEA models which assess efficiency and effectiveness jointly (Yu & Lee,(2009); Hsieh & Lin, 2010). Both integrated and separate two-stage DEA models provide valuable managerial information by considering the efforts of two interrelated processes separately and generates consistent improvement strategies (Chiou, Lan, & Yen, 2010). Although, the interrelated performance between two stages is considered in the integrated two-stage DEA modelling, the separate two-stage DEA model, however, enables one to measure relative optimal values of inputs and outputs based on recommendations of benchmarks obtained from slack value analysis. The scale economy and slack values for each hotel are not easy to calculate using integrated two-stage DEA models.

Lan and Lin (2003) employed separate two-stage DEA model to estimate efficiency and effectiveness of railway industry in Taiwan. Keh, Chu, and Xu (2006) measured technical efficiency and marketing effectiveness of Asia–Pacific hotel industry also use the separate two-stage DEA model. In their studies, in the first stage the raw inputs including total expenses and the number of rooms are minimized under a given level of marketing expenses. In the second stage the revenue from services is maximized using given marketing expenses to show the effectiveness of marketing. Chiu and Huang (2011) employed an integrated two-stage DEA model to assess technical efficiency and profitability efficiency of the hotels in Taiwan. In the first stage they use inputs such as total operating expenses, area of catering space, number of employees, and number of rooms which are minimized under a given level of occupancy rate as potential output. In the second stage they use profit as the final output which is maximized using a given level of occupancy rate.

According to Hsieh and Lin (2010), based on management objectives and the importance of a process or factor in hotel operation, it is possible to measure efficiency of a specific process or factor. Due to the importance of marketing division in performance of hotels, this study employs a separate two-stage DEA model to measure efficiency and effectiveness of marketing. Using this model, relative optimal values of marketing expenses and profit can be determined based on slack values.

METHODOLOGY

In order to specify the model employed in this study, first, conventional DEA models are mathematically explained as follows:

The Constant Return to Scale Model (CRS DEA Model)

Assume a group of n Decision Making Units (DMUs), with each DMU j, (j = 1,. . .,n) employing m inputs (i = 1,. . .,m) and producing s outputs (r = 1,. . ., s). If the multipliers (weights) related to output r and input i, respectively, are given, the efficiencyof DMU j,, can be stated by the ratio of weighted outputs to weighted inputs as:

$$\theta_j = \frac{\sum_r u_r y_{rj}}{\sum_i v_i x_{ij}} \tag{1}$$

In the case of unknown multipliers (weights), Charnes et al. (1978) derived values of weights for a given DMU through solving mathematical programming problem. Their model for obtaining the optimal weights and subsequently measuring the technical efficiency of DMUj solves the following linear programming (LP) model:

$$\max_{u,v} \theta_o \qquad \sum_r u_r y_{ro} \Big/ \sum_i v_i x_{io} \tag{2}$$

subject to: $\sum_r u_r y_{rj} - \sum_i v_i x_{ij} \le 0$ for all j

$u_r, v_i \ge 0$ for all r, i

Where the value of computed is the efficiency score for the DMUo that is less than or equal to one, The DMUs with efficiency scores equal to 1 are on the frontier and technically efficient and the scores less than 1 indicate corresponding DMUs do not operate efficiently.

The Variable Returns to Scale model (VRS DEA Model)

The CRS linear programming problem can be converted to VRS model using the convexity constraint as follows:

$$\max_{u,v} \theta_o \qquad \left[\sum_r u_r y_{ro} - u_o\right] \Big/ \sum_i v_i x_{io} \tag{3}$$

s.t. $\sum_r u_r y_{rj} - u_o - \sum_i v_i x_{ij} \le 0$ for all j

$u_r, v_i \ge 0$ for all r, i

According to Coelli, Rao, O'Donnell, and Battese (2005), DEA model under constant returns to scale assumption is applicable for the DMUs which operate at optimal scale. In certain situations where conditions such as imperfect competition, financial restrictions, and government regulations exist, DMUs may not operate at optimal scale. Therefore, VRS technology which enables one to evaluate the efficiency of each DMU relative to the similar scale DMUs is more realistic and applicable, particularly in the case of this study.

In order to measure the efficiency and effectiveness of marketing activities, the following separate two-stage DEA model: the input-oriented DEA model under VRS assumption to measure marketing efficiency and an output-oriented DEA model under VRS assumption to assess marketing effectiveness is employed:

First stage:

$$\max_{u,v} \theta_o^1 \qquad \left[\sum_d u_d z_{do} - u_o\right] \Big/ \sum_i v_i x_{io} \tag{4}$$

$$\text{s.t.} \qquad \sum_d u_d z_{do} - u_o - \sum_i v_i x_{ij} \le 0 \qquad j = 1, \ldots\ldots, 27$$

$$u_d, v_i \ge 0 \qquad i = 1, 3, \ldots\ldots, 3, \qquad d = 1$$

Second stage:

$$\min_{u,w} \theta_o^2 \qquad \left[\sum_d w_d z_{do} - u_1\right] \Big/ \sum_r u_r y_{ro} \tag{5}$$

$$\text{s.t.} \qquad \sum_d w_d z_{do} - u_1 - \sum_r u_r y_{rj} \le 0 \qquad j = 1, \ldots\ldots, 27$$

$$u_r, w_d \ge 0 \qquad d = 1, \quad r = 1$$

Where:

x_{ij} is the amount of input (i) which has been applied by jth hotel, which include sale marketing expenses (x_1), promotion marketing expenses (x_2), and the number of marketing employees (x_3)

x_{io} is the amount of input (i) which has been applied by hotel under evaluation,

z_{dj} is the amount of intermediate output (d) which has been applied by jth hotel, which include (z_1) occupancy rate of hotel which is considered as the output in the first stage and as the input for the second stage.

z_{do} the amount of intermediate output (d) that has been used by the hotel under evaluation,

y_{rj} is the amount of output (r) which has been applied by jth hotel, including (y_1) profit rate,

y_{ro} is the amount of output (r) that has been used by the hotel under evaluation.

Estimation Technique and Data Source

To run the DEA model , following Banker, Janakiraman, and Natarajan (2004), and Bosetti, Cassinelli, and Lanza (2004) a panel analysis approach is used in order to analyze efficiency trends over time. Since a panel DEA approach is employed, all the expenses and revenue are converted into real expenses and revenue by using the Malaysia's consumer price index (CPI), for which the base year is 2005.

The data employed in this study are collected from a field survey of 27 three- to five-star hotels in Kuala Lumpur, ranging from year 2004 to 2010. It has 165 observations altogether. The hotels are selected from five main locations: Golden Triangle, Chowkit, China Town, KL Sentral, and Mid Valley City, where there are many hotels and they are agglomerated. The data collection has been conducted by applying structured questionnaires that has been sent to the hotels concerned.

RESULT AND DISCUSSION

Since DEA is very sensitive to the accuracy of the data (Hsieh & Lin, 2010), according to Banker and Chang (2006), and Lan and Lin (2003), identifying and removing the outliers using the super efficiency model, proposed by Andersen and Petersen (1993), leads to more reliable and accurate efficiency estimates. Therefore, first, the super efficiency of the hotels is calculated and the outliers that have a super efficiency score of more than 1.2 are removed from the reference data (Banker & Chang, 2006). Therefore, the reference data is now reduced from 165 to 161 observations. The next step, the separate two-stage DEA model under VRS assumption is employed on the remaining observations.

The scores of marketing efficiency and marketing effectiveness for all three- to five-star hotels are computed and listed in Table 1. Where marketing efficiency measure is concerned, there are 18 efficient hotels, including three five-star hotels [H1(2005), H2(2010), H9(2010)], five four-star hotels [H16(2004), H16(2006), H16(2007), H16(2008), H17(2006)], and 10 three-star hotels [H25(2004), H25(2005), H25(2006), H25(2007), H25(2008), H25(2009), H26(2004), H26(2005), H30(2009), H30(2010)]. As for marketing effectiveness, the result shows that two hotels are efficient. One is a five-star hotel [H2(2010)] and another one is a three-star hotel [H24(2007)]. Only one hotel achieved both marketing efficiency and marketing effectiveness, which is a five-star hotel [H2(2010)]. According to the results, most hotels marketing effectiveness is lower than marketing efficiency from 2004 to 2010.

Based on the results, on the average, marketing efficiency of three- to five-star hotels in Kuala Lumpur during the period of 2004 to 2010 is about 59 per cent. In other words, these hotels could reduce the marketing inputs by 41 percent without

changing the output level. Marketing effectiveness of the hotels over the period under study, on the average is about 29 percent. It means that the maximum profit made using the capacity of the hotels is about 29 percent of the maximum profit that can be made using the same service capacity and marketing technology on the overall frontier. The findings show that the average marketing effectiveness is lower than marketing efficiency. The result of the Pearson correlation test indicates a highly positive correlation between efficiency and effectiveness of marketing that is equal to 0.873. That is, improving marketing efficiency would lead to higher marketing effectiveness and consequently higher profitability level.

Table 1 Marketing Efficiency (ME) and Marketing Effectiveness (MEV) of the hotels in the years 2004 to 2010

Year		2004		2005		2006		2007		2008		2009		2010	
Hotel no.	Hotel code	ME	MEV	ME	MEV	ME	MEV	ME	MEV	ME	MEV	ME	MEV	ME	MEV
1	H1	0.394	0.837	1	0.95	0.817	0.899	0.431	0.909	0.396	0.995	0.569	0.887	0.857	0.876
2	**H2**	0.494	0.711	0.471	0.621	0.597	0.646	0.426	0.713	0.348	0.847	0.351	0.816	1	1
3	**H3**	0.49	0.148	0.495	0.124	0.5	0.159	0.51	0.172	0.386	0.199	0.387	0.149	0.351	0.188
4	**H5**	0.49	0.035	0.372	0.048	0.377	0.043	0.371	0.049	0.37	0.055	0.363	0.051	0.351	0.063
5	**H7**	-	-	-	-	-	-	-	-	0.621	0.186	0.561	0.251	0.633	0.277
6	**H8**	-	-	-	-	-	-	-	-	0.387	0.212	0.387	0.32	0.389	0.349
7	**H9**	0.734	0.682	0.674	0.74	0.43	0.743	0.369	0.761	0.456	0.861	0.581	0.966	1	0.844
8	**H10**	-	-	-	-	0.351	0.109	0.35	0.184	0.357	0.213	0.357	0.223	0.36	0.278
9	**H11**	0.514	0.313	0.5	0.348	0.928	0.365	0.399	0.285	0.397	0.302	0.521	0.387	0.561	0.42
10	**H12**	0.62	0.238	0.945	0.263	0.589	0.253	0.389	0.234	0.396	0.237	0.38	0.313	0.391	0.274
11	**H13**	0.669	0.207	0.689	0.221	0.653	0.244	0.609	0.232	0.621	0.253	0.541	0.369	0.557	0.436
12	**H15**	0.585	0.136	0.565	0.158	0.578	0.181	0.51	0.138	0.538	0.16	0.492	0.179	0.471	0.193
13	**H16**	1	0.681	-	-	1	0.631	1	0.593	1	0.653	-	-	-	-
14	**H17**	0.521	0.362	0.65	0.524	1	0.575	0.751	0.311	0.872	0.325	0.7	0.459	-	-
15	**H18**	0.444	0.042	0.443	0.044	0.462	0.042	0.455	0.046	0.448	0.045	0.459	0.045	0.454	0.053
16	**H19**	0.585	0.223	0.536	0.194	0.556	0.25	0.51	0.266	0.538	0.25	0.492	0.263	0.465	0.295
17	**H20**	0.382	0.147	0.378	0.162	0.387	0.191	0.346	0.093	0.345	0.124	0.364	0.195	0.412	0.242

Table 1 (*Cont'd*)

18	**H21**	0.621	0.093	0.625	0.097	0.629	0.115	0.6	0.068	0.551	0.056	0.783	0.085	0.398	0.136
19	**H22**	0.812	0.055	0.791	0.071	0.813	0.074	0.818	0.057	0.619	0.075	0.606	0.086	0.619	0.073
20	**H23**	0.742	0.098	0.753	0.089	0.766	0.081	0.627	0.071	0.647	0.084	0.46	0.091	0.464	0.086
21	**H24**	-	-	0.91	0.467	0.644	0.077	0.645	1	0.462	0.201	0.65	0.052	0.619	0.052
22	**H25**	1	0.055	1	0.052	1	0.033	1	0.04	1	0.04	1	0.053	-	-
23	**H26**	1	0.051	1	0.034	0.736	0.057	0.868	0.054	0.741	0.045	0.661	0.044	0.433	0.057
24	**H27**	-	-	-	-	-	-	-	-	-	-	-	-	0.466	0.081
25	**H28**	0.547	0.161	0.605	0.198	0.516	0.372	0.471	0.168	0.405	0.181	0.532	0.289	0.454	0.429
26	**H29**	0.609	0.282	0.617	0.242	0.588	0.339	0.565	0.352	0.53	0.366	0.4	0.632	0.39	0.362
27	**H30**	-	-	-	-	-	-	-	-	-	-	1	0.26	1	0.313
Mean		0.631	0.265	0.668	0.269	0.649	0.282	0.566	0.295	0.537	0.279	0.544	0.299	0.546	0.307

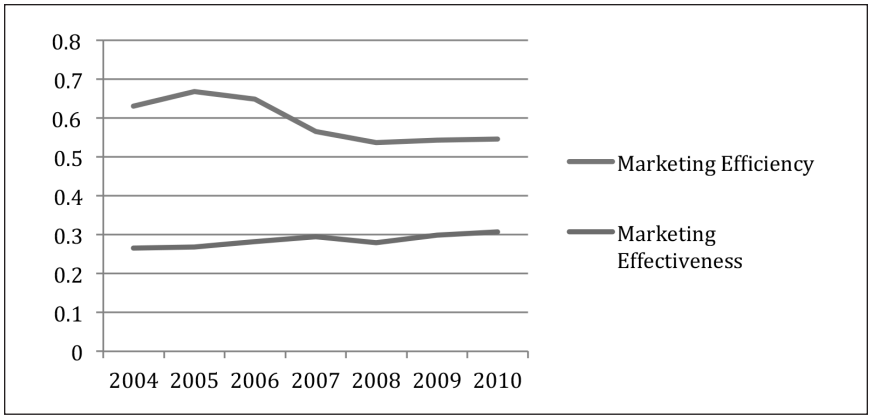

Figure 1 Trend of marketing efficiency and marketing effectiveness of hotels, 2004 – 2010

Figure 1 shows the trend of marketing efficiency and marketing effectiveness of the hotels over the period under study. The downward trend of marketing efficiency during 2004 to 2010 fluctuated occasionally between 0.537 and 0.668. The marketing efficiency experienced a slight fall from 2005 to 2008. The reduction could be related to the heightened competition, either locally or globally, as a consequence of globalization in the recent years as well as the advent of global slowdown (2007–2009) and threat of influenza A H1N1 in 2008. Between 2008 and 2010, the trend increased slightly. This could be attributed to ending of the period of uncertainties mentioned above plus the government's serious efforts in promoting tourism in the country..

The minimal upward trend of marketing effectiveness from 2004 to 2010 changed between 0.265 and 0.307. The increasing trend is mostly related to the increase of tourist arrivals and subsequently the rise in average occupancy rate of the hotels. However, the marketing effectiveness saw a minor decline in 2008, which may be due to the escalation of the global slowdown.

Efficiency and Effectiveness of Marketing Based on Star Ranking Analysis

The sample size of this study is 27 hotels consisting of 8 five-star hotels (H1:H10), 9 four-star hotels (H11:H20), and 10 three-star hotels (H21:H30). Classification of the hotels is based on star ranking which can provide comparison in terms of efficiency and effectiveness that is more consistent and homogenous. According to Figure 2; where marketing efficiency is concerned, the lower-star-ranking hotels

operated more efficiently than the higher-star-ranking ones. This is because the lower star ranking hotels has benefitted from agglomeration externalities through the contribution of the higher star ranking hotels. In the areas where hotels are agglomerated, the infrastructure, such as shops, restaurants, and transportation, and the traits, such as known brands which are mostly created by higher star ranking hotels, normally attract more travellers. Moreover, the spill over due to the overflow of higher star ranking hotels' customers in times of excess demand may direct customers to lower star ranking hotels (Tsang & Yip, 2009). As for marketing effectiveness, the results indicate that the hotels with the higher number of stars transformed the utilized capacity into the profit more effectively than those hotels with the lower number of stars. Oliveira, Pedro, and Marques (2012) postulated that the result is associated with the fact that the higher star ranking hotels are normally larger, hence, they benefitted by operating at economies of scale.

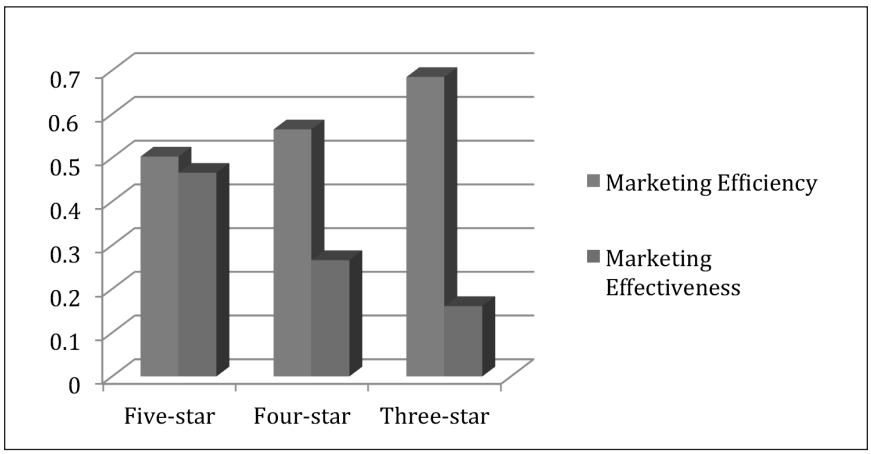

Figure 2 Mean of efficiency and effectiveness of marketing in three-, four-, five-star hotels, 2004-2010

Slack Analysis and Relative Optimal Values of Marketing Expenses and Profit

Although DEA identifies the inefficient DMUs, it cannot give one a full understanding of inefficiency determinants (Pulina, Dettoto, & Paba, 2010). DEA only directs the attention to the divisions in which inefficiency exists as well as amount of variations in outputs and inputs that help one achieve the necessary improvement to gain the score on an efficient frontier (Bessent & Bessent, 1980) Pulina, Dettoto, & Paba, 2010). According to Barros (2005), DEA determines

the slacks for the inefficient DMUs and gives to each peer group (a reference set), which enables them to improve their efficiency according to the specific recommendations of the reference set. When identifying the adjustments of outputs and inputs for the inefficient DMUs, this can help them to catch up with the efficient frontier. Accordingly, slack analysis is done to identify inefficiency sources and the improvement of resource allocation for all inefficient hotels. Table 2 and Table 3 present useful information on the possible ways to promote efficiency and effectiveness by the slack analysis.

Following Chiou and Chen (2006) and Barros (2005), slack values can be divided into two types: 1) the radial movement that assesses the distance of the inefficient DMU from the efficient frontier, namely its benchmark; 2) the non-radial movement that is the movement along the efficient frontier from the best practice to another efficient DMU or the reference DMU. Both radial and non-radial slack values of each hotel in 2010 are presented in Tables 2 & 3, showing the adjustment of resource allocation. Based on this analysis, the improvements for each hotel in each aspect can be addressed separately. Hotel H8, a five-star hotel, is taken as an example of adjustment according to the slacks in respect of both marketing efficiency and marketing effectiveness.

Table 2 Slack values of input/output variables for each hotel in the aspect of marketing efficiency in 2010

Hotels		Input Variables						Output Variables	
		ML*		SME*		PME*		OR*	
No.	Code	Radial	Non-radial	Radial	Non-radial	Radial	Non-radial	Radial	Non-radial
1	H1	-0.714	0.000	-37.565	0.000	-75.116	0.000	0.000	0.000
2	H2	0.000	-1.000	0.000	0.000	0.000	-210.500	0.000	0.000
3	H3	-3.244	0.000	-136.571	0.000	-409.778	-87.583	0.000	0.035
4	H5	-3.244	0.000	-136.571	0.000	-273.207	-13.655	0.000	0.065
5	H7	-1.467	0.000	-77.185	0.000	-270.165	-143.810	0.000	0.000
6	H8	-3.054	0.000	0.000	0.000	-257.214	-89.067	0.000	0.017
7	H9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	H10	-2.561	0.000	-229.183	-13.473	-404.447	0.000	0.000	0.000
9	H11	-1.755	0.000	-138.584	0.000	-230.958	-84.027	0.000	0.000
10	H12	-2.435	0.000	-160.206	0.000	-557.433	-152.896	0.000	0.000
11	H13	-1.771	-0.229	-46.620	0.000	-233.011	-234.609	0.000	0.000
12	H15	-2.646	-0.354	-66.840	0.000	-389.926	-287.414	0.000	0.000
13	H18	-1.637	0.000	-172.290	-12.734	-298.643	0.000	0.000	0.031
14	H19	-2.677	-0.323	-67.620	0.000	-394.477	-283.643	0.000	0.000
15	H20	-2.350	0.000	-187.591	0.000	-494.741	-132.783	0.000	0.000
16	H21	-1.806	0.000	-221.753	-6.308	-475.228	0.000	0.000	0.000
17	H22	-1.143	0.000	-100.317	-50.062	-60.182	0.000	0.000	0.066
18	H23	-1.607	0.000	-112.738	0.000	-507.403	-192.254	0.000	0.024
19	H24	-1.143	0.000	-120.365	-82.614	-60.182	0.000	0.000	0.016

Table 2 (*Cont'd*)

20	**H26**	-1.702	0.000	-179.137	0.000	-417.948	-19.686	0.000	0.000
21	**H27**	-1.601	0.000	-112.323	0.000	-280.834	0.000	0.000	0.044
22	**H28**	-2.183	0.000	-126.370	0.000	-402.027	-183.098	0.000	0.000
23	**H29**	-1.829	0.000	-224.662	0.000	-481.463	-8.232	0.000	0.000
24	**H30**	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: *ML: Marketing Labour, SME: Sale Marketing Expenses, PME: Promotion Marketing Expenses, OR: Occupancy Rate

Table 2 shows the adjustments proposed for H8. It is observed that there exist slacks in the occupancy rate of the hotels; hence, the output can be increased based on the projected value. With regard to the utilization of the inputs, there have been slacks in the utilization of the surface area, the marketing labor, the expenses on marketing activities including sales and promotion, which signify that these inputs are being used inefficiently. As a result, it is advisable for the marketing department to establish the margin to reduce the inputs and to increase the output in order to join the efficient frontier. Where marketing effectiveness is concerned, this hotel can increase its profit under its current capacity utilization (i.e. occupancy rate). Hotel H8 can reduce the marketing labor by 3.054 and the cost of market promotion by 346.281 so as to achieve a higher level of marketing efficiency, as shown in Table 2. In addition, this hotel will be able to increase its profitability by 3543.369 to catch up with the effective frontier as in Table 3.

Table 3 Slack values of input/output variables for each hotel in the aspect of marketing effectiveness in 2010

Hotels		Input Variable		Output Variable	
		Occupancy Rate		Profit	
No.	Code	Radial	Non-radial	Radial	Non-radial
1	H1	0.000	0.000	959.956	0.000
2	H2	0.000	0.000	0.000	0.000
3	H3	0.000	0.000	3956.322	0.000
4	H5	0.000	0.000	4034.176	0.000
5	H7	0.000	0.000	5300.758	0.000
6	H8	0.000	0.000	3543.369	0.000
7	H9	0.000	0.000	1353.500	0.000
8	H10	0.000	0.000	3930.169	0.000
9	H11	0.000	0.000	4146.609	0.000
10	H12	0.000	0.000	4365.416	0.000
11	H13	0.000	0.000	3386.516	0.000
12	H15	0.000	0.000	5001.164	0.000
13	H18	0.000	0.000	4077.976	0.000
14	H19	0.000	0.000	4234.716	0.000
15	H20	0.000	0.000	4841.313	0.000
16	H21	0.000	0.000	4535.620	0.000
17	H22	0.000	0.000	3639.878	0.000
18	H23	0.000	0.000	4281.073	0.000

Table 3 (*Cont'd*)

19	H24	0.000	0.000	4621.222	0.000
20	H26	0.000	0.000	5312.418	0.000
21	H27	0.000	0.000	3955.176	0.000
22	H28	0.000	0.000	3754.262	0.000
23	H29	0.000	0.000	3109.822	0.000
24	H30	0.000	0.000	5691.702	0.000

CONCLUSION

This study measures the efficiency and effectiveness of marketing of the three to five star hotels in Kuala Lumpur using three critical factors in a hotel operation, namely; marketing expenses, occupancy rate and profit. Unlike the previous studies which employ static models to estimate DEA, the present study uses panel DEA to evaluate efficiency and effectiveness scores over time. This is because it is believed that the panel DEA is more likely to show the real efficiency scores of the hotel, which will therefore lead to more robust results.

This paper employs a separate two-stage DEA model to measure the hotels' success in lowering the marketing expenditure to provide a given level of occupancy rate (i.e. marketing efficiency) and the hotels' success in achieving higher level of profit at a given level of occupancy rate (i.e. marketing effectiveness). Based on the marketing performance analysis the hotels, particularly the lower star-ranking ones have considerable managerial problems in transforming the utilized service capacity (i.e. the occupied rooms) into profit. On the other hand, the hotels with the higher number of stars tend to have more technical problems in transforming the marketing inputs into the occupied rooms.

Due to highly positive correlation between marketing efficiency and marketing effectiveness, the hoteliers should focus on improvement of marketing efficiency in order to increase profitability level. Accordingly, the hotels which face marketing inefficiency are highly recommended to apply the recommendations of the benchmarks as a reference for improvement in the marketing inputs' allocation and profit level. It is also recommended that the hotels review their market position in order to attract potential consumers. To do this they should differentiate their services and products from that of their competitors; such as; by providing diversified facilities, like multinational cuisine and recreational activities that the neighbouring hotels do not have. They can also apply incentives through pricing strategies, such as promotions, discounts or free room upgrades, or by cooperating with travel agencies and website enterprises to offer travel packages to attract

more consumers. It is no doubt that the promotional discounts may lead to higher marketing expenses and a lower profit margin but this strategy can be beneficial for the hotels in the short run.

The findings of this study can be of interest to the government, particularly in the process of adopting development policies to the hotel industry. Based on the results of this study, the policy implication is that government can offer short-run tax exemptions for hotels that invest in staff training particularly in the area of marketing and new marketing technologies. This policy would provide the hotels with higher marketing efficiency and subsequently higher profitability in the long run.

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