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SHORT AND LONG-TERM PRICE ELASTICITY OF ROOM DEMAND-A TOOL FOR REVENUE MANAGEMENT: A HOTEL CASE STUDY IN BALI

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Abstract

Room revenue is one of the biggest revenues in the hotel industry which is cited in the literature contributed 70-75% to total hotel revenue. Due to these roles, extant studies have been done in room revenue management. This study applied archival data to answer the proposed research questions. Prior to conducting empirical research personal approaches have been done by contacting directly hotel managers in resort area of Nusa Dua Bali to see the possibility of obtaining the needed data. We got information that data on revenues especially rooms were prohibited for research activities. It may only be used for internal hotel use only. The managerial implications of this study are the following. First, that the management of MBLH hotel should design its room rate structures in such a way that could capture the dynamics of the seasons and guest segments. Second, that the management of MBLH hotel should review its policy on marketing especially on room rates contracts with all of its partners. The findings of this study are applicable only for the MBLH hotel and thus they cannot be generalized for hotels in Bali. Second, the length of daily observation covered only for 488 daily observations. It needs a longer daily observation to achieve a better result. Based on those limitations it is strongly suggested to conduct a similar study covering all classes of hotels all over Bali province with longer daily observations.

Keywords: Revenue management, Price elasticity

Abstrak

Pendapatan kamar merupakan salah satu pendapatan terbesar di industri perhotelan yang dikutip dalam literatur menyumbang 70-75% terhadap total pendapatan hotel. Karena peran ini, studi yang ada telah dilakukan di manajemen pendapatan kamar. Penelitian ini menggunakan data arsip untuk menjawab pertanyaan penelitian yang diajukan. Sebelum melakukan pendekatan empiris, pendekatan pribadi dilakukan dengan menghubungi manajer hotel langsung di daerah resor Nusa Dua Bali untuk melihat kemungkinan memperoleh data yang dibutuhkan. Kami mendapat informasi bahwa data pendapatan terutama ruangan dilarang untuk kegiatan penelitian. Ini hanya bisa digunakan untuk penggunaan hotel internal saja. Implikasi manajerial dari penelitian ini adalah sebagai berikut. Pertama, pengelolaan hotel MBLH harus merancang struktur tarif kamarnya sedemikian rupa sehingga bisa menangkap dinamika musim dan segmen tamu. Kedua, pengelolaan hotel MBLH harus meninjau kembali kebijakan pemasarannya terutama mengenai kontrak tarif kamar dengan semua mitranya. Temuan penelitian ini hanya berlaku untuk hotel MBLH dan karenanya tidak dapat digeneralisasi untuk hotel di Bali. Kedua, panjang pengamatan sehari-hari hanya mencakup 488 pengamatan harian. Diperlukan observasi harian yang lebih lama untuk mencapai hasil yang lebih baik. Berdasarkan keterbatasan tersebut, sangat disarankan untuk melakukan studi serupa yang mencakup semua kelas hotel di seluruh provinsi Bali dengan pengamatan harian yang lebih lama.

Kata kunci: Manajemen pendapatan, Elastisitas harga

JEL Classification: M11, G2

1. Research Background

Room revenue is one of the biggest revenues in the hotel industry which is cited in the literature contributed 70-75% to total hotel revenue. Due to these roles, extant studies have been done in room revenue management. In doing studies on room revenue management scholars focused on, among others in the area of forecasting techniques (Weatherford *et al.,* 2001, Zakhary *et al.,* 2011), its meaning (Jauncey *et al.,* 1995), and Weatherford, 1995), value approach (Bayoumi *et al.,* Lewis and Shoemaker, 1997, Vinod, 2004, and Choi, 2006), optimization (Choi and Cho, 2000 and Tse and Poon, 2012), distribution channel (Choi and Kimes, 2002) and tourist behavior (Bodea, 2008).

Although the concept of yield management was primarily applied in airline industry, this concept was adopted by hospitality industry with some adjustments (Belobaba cited in Weatherford, 1995). There was a debate among scholars for terminology yield management and revenue management. Yield management appears to be inadequate to describe the generic problem that spans all of the suitable industries. This was because the word yield has many definitions: one definition is the revenue per passenger mile. With this strict interpretation, it implies the wrong kind of maximization problem (Weatherford, 1995). Others did not make difference between revenue management and yield management (Chan and Kachani, 2007).

The concept of revenue management is appropriately applied in the service industries like airline and hotel industry due to some features like fixed capacity and product perishability (seats in an airplane and room available for a hotel). Though those aforementioned features could hamper the revenue of its respective industry, proper applications of revenue management techniques enhanced their revenue by 4.7% (Weatherford, 1995).

The application of revenue management actually is influenced by internal and external factors. Internal factors like management policy, capacity of room displacements, human resources competencies, and system applications. External factors like macro economic conditions, technogy advancement, channel of distributions, and market segmentation also plays an important role in boosting room revenue. Market segments are very important in applying revenue management techniques especially when quoting room prices. The responses of each market segments are different to room prices. Technically, these responses termed as room price elasticity (Tse and Poon, 2012). Another strategic variable that accounts for room revenue is length of stay (LOS). LOS and market segment in aggregation plays an important role in determining room revenue (Weatherford, 1995 and Weatherford *et al.,* 2001). Internal factors like room capacity and staff competency in forecasting are also key points in enchancing room revenue. A generic formula to do a daily forecast is based on the guests in the house, expected arrivals,and expected departures. Pricing is a key factor in determining room revenues. A proper pricing technique may result in an optimum result given the competitive set faced. Pricing drives the potential guest to book a room when he / she thinks that it worth for the utility he / she would get. On the other hand, he / she will deny to booking if it was considered too high an offer that he / she could not afford. Stated differently, that price and quantity demanded as found in any economic literatures has an inverse relationship. Yet, to make the inverse relation not that big due to the seasonal feature of room demand, dynamic pricing should be applied (Bayoumi *et al.,)* This statement is quite true since the advancement of information technology embedded into a smart phone. This situation drives the hotel to always update its room inventory availability so that room rate could be offered in such a way so as to boost room revenue given the competition. Bali is one of The Republic of Indonesia provinces with its provincial revenue derived significantly from tourism. It has become public knowledge that tourism contributes Bali's total revenue ranging from 25 to 30 %. The total numbers of hotel rooms available in Bali have been growing in a relatively stable fashion for the last five years. The growth of hotel room availability is presented in Table 1 below.

Table 1. The growth of hotel rooms in Bali

No	Type of accommodation	2008		2009		2010		2011		2012	
		Unit	Room	Unit	Room	Unit	Room	Unit	Room	Unit	Room
1	Star hotels	155	20719	157	21118	158	20558	161	20753	156	20269
2	Melati hotels	999	19917	1037	20516	1036	20410	1026	20199	1031	21114
3	Hostels	925	4212	981	4380	996	4440	1016	4478	1025	4642
	Total	2079	44848	2175	46014	2190	45408	2203	45430	2212	46025

Source: Bali Government Tourism Office

From Table 1 above, the following could be analyzed. If we take 2008 as the base year, there was 2.6% growth in 2009, 1.2 % in 2010, 1.2 % in 2011, and 2.6 % in 2012 for the total number of hotel rooms.

Star hotels have the following growth for their room availability. Again, we take 2008 as base year. In 2009, there was an increase of 399 rooms (1.9 %), in 2010 decreased to 161 rooms (0.7%), in 2011 increased to 34 rooms (0.2 %), and in 2012 decreased to 450 rooms (0.22 %). Melati hotels experienced the following. In 2009, there was an increase of 599 rooms (3.0 %), in 2010 increased to 493 rooms (2.5%), in 2011 increased to 282 rooms (1.4 %), and in 2012 increased to 1197 rooms (6.0 %). Hostels have experienced the following. In 2009, there was an increase of 168 rooms (4.0 %), in 2010 increased to 228 rooms (5.4%), in 2011 increased to 266 rooms (6.3 %), and in 2012 increased to 430 rooms (10.2 %).

In terms of length of stay (LOS) and daily tourist expenditures Bali has the following experiences as presented in Table 2 below.

Table 2. Tourists LOS and Daily Expenditures

Variable	2008		2009		2010		2011		2012	
	Forgn.	Dom.	Forgn.	Dom.	Forgn.	Dom.	Forgn.	Dom.	Forgn.	Dom.
LOS	9.65	3.5	8.75	4.20	9.49	4.20	9.27	3.90	9.10	3.60
Daily exp.	148.40*	354**	137.90*	516**	147.40*	503**	154.87*	592**	155.27*	635**

Source: Bali Government Tourism Office. *: in USD. **: in thousand rupiah. LOS: Length of Stay. Daily Exp.: daily expenditures. Forgn.: Foreign. Dom.:domestic

From Table 2 above for five consecutive years one could infer that foreign LOS is longer compared to domestic LOS. The shortest LOS for foreign tourists was in 2009. This situation may be the impact of the global financial crisis that broke out in 2008. Daily tourist expenditures could be broken down to room, food and beverage, transportation, souvenirs, guide fees, and miscellaneous expenses. From the daily tourist expenditures, room expenses incur up to 42 % (Bali Government Tourism Office, 2002). This finding suggests that in general room revenue is still the biggest income generated by a hotel.

Based on our prior investigation in two different class hotels, it was found that budgeted room revenues always exceeded the actual room revenues. The actual room sold and the average room rates were under budget. These primary phenomena lead to suspicion that these hotels need to practice better revenue management techniques. Our study differs from others in its focus. The focus of our study is to investigate the magnitude of its price demand elasticity to room occupancy. We also investigate the elasticity of price room demand for each guest segment as well as short-term and long-term price elasticity of demand.

1.1 Research questions

Based on the above analysis the following research questions are posed:

1. How is price elasticity of room demand affected by the season?
2. Is there any difference in the magnitude of each market segment?
3. What is the optimal room rate to practice room revenue management given the elasticity and variable room expenses?

1.2 Research Objectives

The objectives of this study are three folds. The first is to investigate price elasticity of room demand. The second is to investigate if the magnitude of elasticity different among market segments. The third is to estimate the optimal room rate given the elasticity and variable room expenses.

1.3 Research Contributions

The significance of our study is that by knowing the magnitude of price elasticity of room demand, the hotel manager could set up room pricing in such a way so as to boost his room revenue given the season. Another contribution of this study is that by providing empirical evidence on room price elasticity of demand, hotel manager could set up a dynamic room pricing given the market segments.

The rest of this study will be organized as follows. The following section will discuss related literature on revenue management, research method, empirical evidence, discussions, and conclusion.

1.4 Literature Review

Extant studies have been done by scholars on revenue management. There was a dynamic debate on the right terminology whether to use the term yield or revenue management. Revenue management embraces a broader area hence termed as Perishable Asset Revenue Management. In revenue management the basic idea is to charge the right price to the right customer while achieving the best possible revenue (Weatherford, 1995). By this notion the hotel should know its market segment, room capacity, seasonality, and length of stay. All of those aforementioned variables could be applied simultaneously to achieve maximum or the highest room revenue. Market segments should be thoroughly analyzed between business and vacationers.

As presented in Table 2 in the previous page LOS is one variable that could boost revenue. Longer LOS prevents a hotel from missing the opportunity to cover operational expenses. Room capacity is another key variable that should be well managed. Managing room capacity could be done amongst others by mastering the number of no-shows. This knowledge would lead the management to set up proper approach on over-booking policy. In analyzing the variables that contribute to room revenue two approaches may be applied.

One approach focusing on either LOS or rate class termed as disaggregation. The other one is by combining those variables. Either approach choosen would give the same result, individual forecast for each price-LOS combination (Weatherford *et al.*, 2001). Controlling rate category and LOS are two variables that should be well managed in revenue management context to enhance hotel room revenue (Quain *et al.*, 1999). Potential hotel guests in general were price sensitive given the season. To measure this price sensitivity hotel management needs to measure how the potential guests respond to prices offered. One method to measure price sensitivity was developed by Westernport (in Lewis and Stowe, 1997). In this method, a survey should be conducted asking the potential guests the range of prices he/she could afford. Several revenue management techniques were developped by scholars. A Probabilistic rule-based framework in Knowledge Discovery techniques where market environment other than room price and its operating costs are taken into account to forecast the availability of hotel guest rooms (Choi and Cho, 2000). In developping these techniques they first adopted the decision-making process of a hotel environment for booking procedures and operational procedures of

actual room acceptance for a certain day. Another technique with the objective to determine an optimal room rate was also developped by Tse and Poon (2012).

In their model the elasticity of room demand, operating room expenses, and actual room rate were included in the model to detemine the optimal room rate to apply revenue management. Price multipliers were also introduced as another technique in hotel room revenue management. Those multipliers include time multiplier, capacity multiplier, LOS multiplier, and group size multiplier (Bayoumi *et al.*,). The revival of information technology especially the internet played a very significant role in room revenue management. Potential guests nowadays are easily able to book their rooms via their smart phones to hotel's web site or via a portal travel agent.

This situation drove the cost of channel of distributions to become more and more economical. On the other side, travel agents should now operate in two types of services, on-line and off line services. On line direct bookings reduced significantlycost of distribution channel (Choi and Kimes, 2002). Room rates controls may significantly influence room revenues. This could be done by establishing proper room rate offer procedures. There were three types of nested room rate to boost room revenues (Vinod, 2004). Those three were multiple serial nesting, multiple parallel nesting, and mixed nesting. Group bookings should also be well managed to update room revenue. To compensate with the volume, group commonly asked for lower price. This problem could be accomplished by controlling the marginal revenues incurred by group bookings (Choi, 2006). Group bookings play important roles in increasing room revenue. Demand and supply analysis approach were strongly suggested by Cross (in Bodea, 2008) to take advantage of future revenue opportunities. Further he emphasized to apply pillars of revenue management in the market in order for hotel to survive in the tight competition.

2. Research Methods

This study applied archival data to answer the proposed research questions. Prior to conducting empirical research personal approaches have been done by contacting directly hotel managers in resort area of Nusa Dua Bali to see the possibility of obtaining the needed data. We got information that data on revenues especially rooms were prohibited for research activities. It may only be used for internal hotel use only. Only one hotel was willing to support the research on hotel revenue management to cover short and long-term price elasticity of room demand. Hence, we considered this study as a case study to estimate the price elasticity of room demand. It was a four-star hotel with 168 rooms. Due to the hotel privacy policy we have changed the name of the hotel, yet the data was archival and provided by this hotel. The hotel's initial share MBLH. The data was daily room booking and average daily rates (ADR).

To obtain the magnitude of price elasticity of room demand a simple regression was run. In this study, the following elasticity of room demands were estimated. The first was elasticity for all data. The second was seasonal; high and low season price elasticity were estimated. The third was segmentation. Four types of guest segments for elasticity of room demands were estimated, individual and group leisure, and individual and group business. Short-run and long-run price elasticity was also estimated for high and low season as well as for group and individual segment using the approach applied by Corgel and Lane (2012). The length of observation to achieve the elasticity was 488 days; from May 1, 2012 to August 1, 2013. Also, the optimal room rate was estimated given the elasticity and variable room expenses. The optimal room rate was estimated using the formula derived by Tse and Poon (2012).

Since the data used in this study was of time series one covering daily occupancy and ADR, serial correlation detection was conducted using Durbin-Watson d test formula as follow (Gujarati 1995).

$$d = \frac{\sum_{t=2}^{t=n}(ut-ut-1)2}{\sum_{t=2}^{t=n} u2t} \quad \text{..... (1)}$$

$\hat{u}_t$: the residual of regression derived by running ordinary least square
$\hat{u}_{t-1}$: the residual lagged one period
$(\hat{u}_t - \hat{u}_{t-1})^2$: square difference of $\hat{u}_t$ minus$\hat{u}_{t-1}$
$\hat{u}_t^2$: square of $\hat{u}_t$

Length of stay and room nights influenced the current room demands. Stated differently today's room occupancy was influenced by yesterday's due to length of stay. Based on this notion the following regression model is derived to capture number of room demanded as the function of room rates and previous stay (see also Corgel and Lane 2012).

$$Y = \alpha + \beta_1 X + \beta_2 Y_{t-1} + \varepsilon \quad \text{..... (2)}$$

Y = number of rooms demanded or room occupied
A = the intercept of the regression
β_1 = Price elasticity of room demand
β_2 = room demandelasticity lagged one period
X = ADR
ε = error terms

In (1) above all variables are in level, for analytical purpose it is transformed to log natural (ln) form.

$$LnY = \alpha + \beta_1 LnX + \beta_2 LnY_{t-1} + \varepsilon \quad \text{..... (3)}$$

To capture seasonal effects for room demand price elasticity the following formula was used which is the same as (3) above.

$$LnY_{hs} = \alpha_{HS} + \beta_1 LnX_{HS} + \beta_2 LnY_{HSt-1} + \quad \text{..... (4a)}$$

$$LnY_{LS} = \alpha_{LS} + \beta_1 LnX_{LS} + \beta_2 LnY_{LSt-1} + \varepsilon \quad \text{..... (4b)}$$

HS and LS stands for high season and low season respectively, other notations are as in (2).

To estimate price elasticity of room demand for each segment i.e. individual and group leisure and individual and group business the following formula was applied.

$$LnY_{IL} = \alpha_{IL} + \beta_1 LnX_I + \beta_2 LnY_{ILt-1} + \varepsilon \quad \text{..... (5a)}$$
$$LnY_{GL} = \alpha_{GL} + \beta_1 LnX_{GL} + \beta_2 LnY_{GLt-1} + \varepsilon \quad \text{..... (5b)}$$
$$LnY_{IB} = \alpha_{IB} + \beta_1 LnX_{IB} + \beta_2 LnY_{IBt-1} + \varepsilon \quad \text{..... (5c)}$$
$$LnY_{GB} = \alpha_{GB} + \beta_1 LnX_{GB} + \beta\ LnY_{GBt-1} + \varepsilon \quad \text{..... (5d)}$$

IL, GL, IB, and GB stands for individual leisure, group leisure, individual business and group business respectively, other notations are as in (2).

To estimate short-term and long-term price elasticity the following formula was applied (Corgel and Lane, 2012):

Short-term price elasticity = $\beta_1$in (3, 4a, 4b, 5a, 5b, 5c, 5d) ..... (6a)

Long-term price elasticity = $\frac{\beta 1}{(1-\beta 2)}$ in (3, 4a, 4b, 5a, 5b, 5c, 5d) ..... (6b)

To estimate the optimal room rate the formula underneath was applied (Tse and Poon, 2012).

$$r = \frac{1}{2}\left[\left(1-\frac{1}{\beta}\right)r_0 + v\right] \quad \text{..... (7)}$$

r = optimal room rate
β = the elasticity of room demand
r_0 = charged room rate
v = variable expense per room

3.Result and Discussion

3.1 Empirical Results

Empirical results such as descriptive statistics, regression results of elasticity of demand, and optimal room rates for MBLH are presented in the following pages.

The descriptive statistics are presented below covering room demand (occupancy) and ADR for all data, seasonal data, and guest segments in MBLH. Figures for room demand and room rates are at their levels.

Table 3. Descriptive Statistics of Room Demand and Price of MBLH

Variables	Count	Mean	Median	Mode	Std.Dev.	Min.	Max	Range
All	488							
Room occupied		99	96	106	36	15	168	153
ADR		395000	388989	401004	56605	248188	769452	521263
High Season	154							
Room occupied		98	92	72	35	32	163	131
ADR		408117	398588	401004	54801	316033	594912	278879
Low Season	334							
Room occupied		100	98	81	37	15	168	153
ADR		389114	384392	n.a.	56598	248188	769452	521263
Group business	325							
Room occupied		24	12	12	22	2	122	120
ADR		337354	316364	313388	61414	172367	740124	740124
Ind. business	484							
Room occupied		20	14	7	18	1	132	131
ADR		463010	441888	326901	305781	146717	6647121	6500404
Group Leisure	428							
Room occupied		24	18	10	23	2	143	141
ADR		280923	252702	238140	77737	59436	662645	603209
Ind. Leisure	487							
Room occupied		39	35	18	22	3	129	126
ADR		447739	437659	446157	66351	314490	909536	595046

Std. Dev.: Standard Deviation. Min.: minimum. Max.: maximum. n.a.: not available. Ind.: individual.ADR: Average Daily Rates

Room demand and ADR movements of high season versus low season are presented below to give a better description of the real situation during the study.

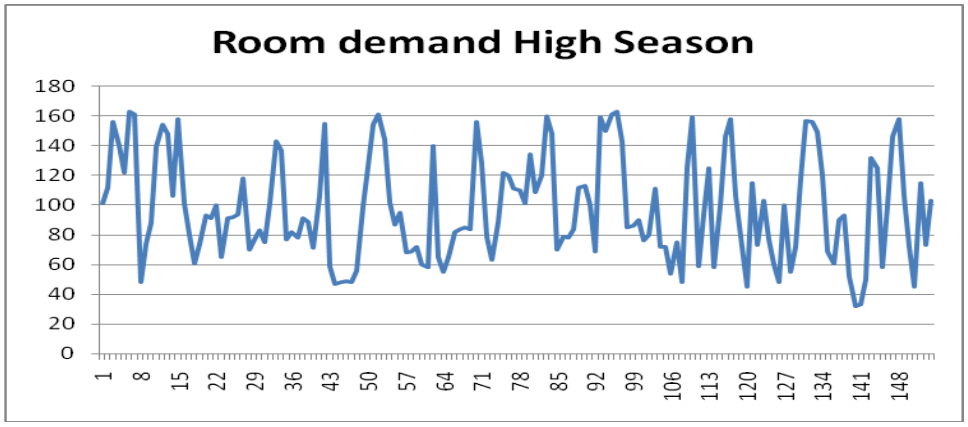

Figure 1. Room Demand High Season
Source: Data Processed, 2013

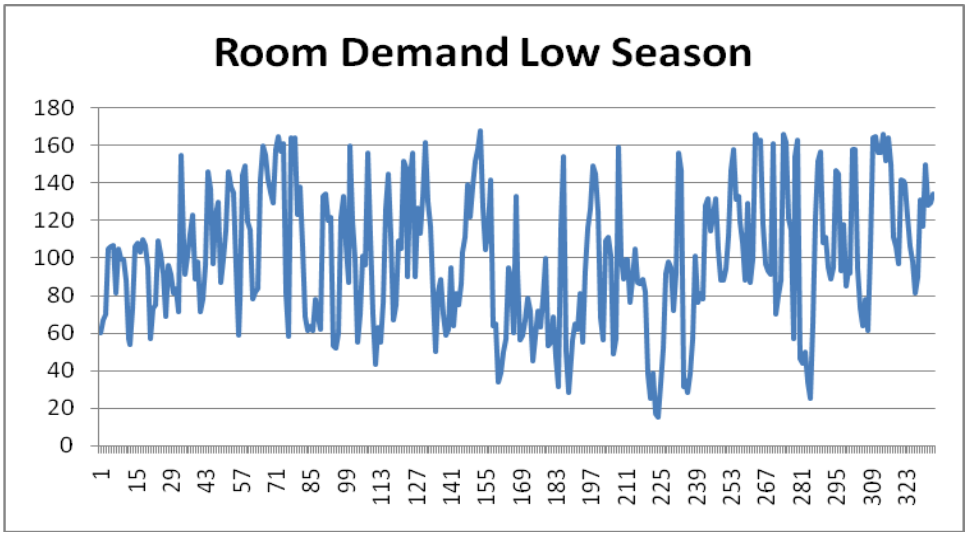

Figure 2. Room Demand Low Season
Source: Data Processed, 2013

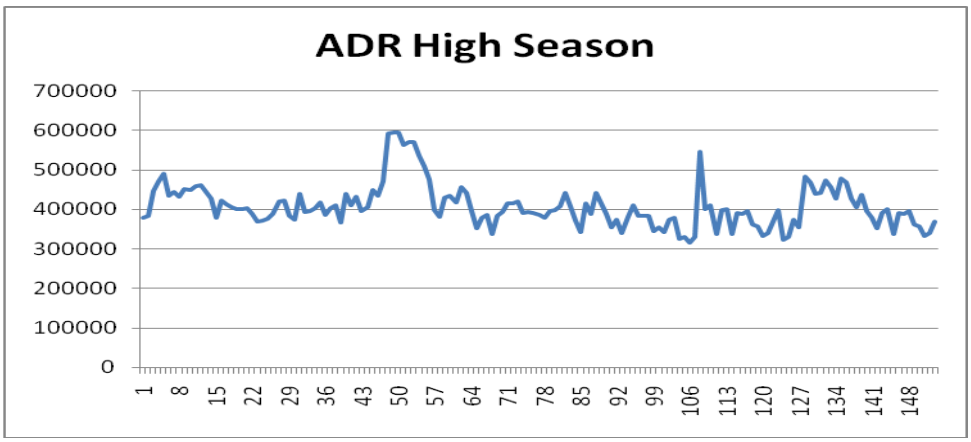

Figure 3. ADR High Season
Source: Data Processed, 2013

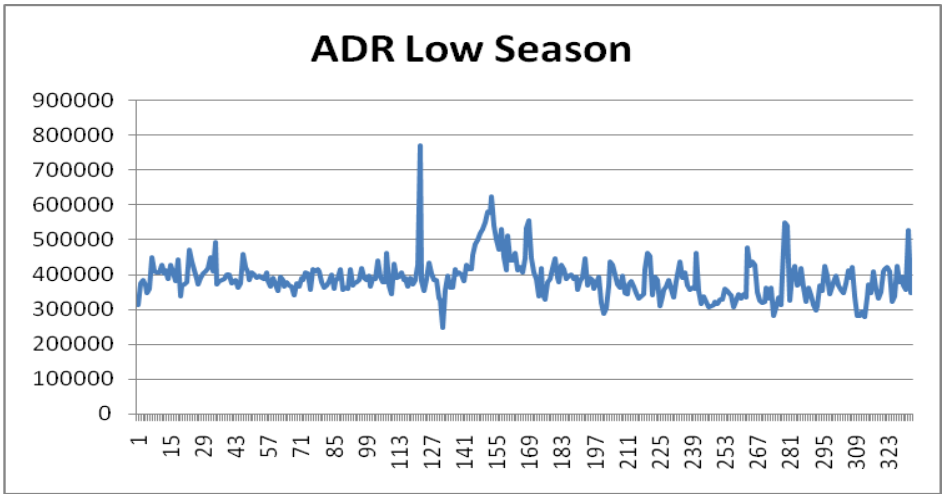

Figure 4. ADR Low Season
Source: Data Processed, 2013

3.2 Durbin-Watson d test result

Applying formula (1) the result of Durbin-Watson d test is 1.840. The decision rules for null hypothesis that no autocorrelation, positive or negative $d_U < d < 4-d_U = 1.789 < 1.840 < 2.211$. Based on this finding we cannot reject the hypothesis that there is no autocorrelation in the residual.

3.3 Regression results of price elasticity of room demand

To obtain the magnitudes of price elasticity of room demand formula (3, 4a, 4b, 5a, 5b, 5c, 5d) was run. The regression results are as follows:

All data:

Room Occ. = 1.26 + 0.04ADR +0.61 Room $Occ._{t-1}$ + ε.
(1.42) (0.11) (0.04)
[0.88] [0.35] [17.01]

( ) and [ ] stands for standard error and t-statistic respectively.
R^2: 0.37. F-statistic: 144.77. ADR: Average Daily Rates. Room Occ.: room occupied.

High Season:

Room Occ. = -1.12 + 0.28ADR + 0.45 Room $Occ._{t-1}$ + ε.
(2.76) (0.22) (0.07)
[-0.41] [1.29] [6.09]

( ) and [ ] stands for standard error and t-statistic respectively.
R^2: 0.23. F-statistic: 22.00. ADR: Average Daily Rates. Room Occ.: room occupied.

Low Season:

Room Occ. = 1.56– 0.0002ADR + 0.66 Room $Occ._{t-1}$ + ε.
(1.71) (0.13) (0.04)
[0.91] [-0.002] [15.73]

( ) and [ ] stands for standard error and t-statistic respectively.
R^2: 0.43. F-statistic: 124.50. ADR: Average Daily Rates. Room Occ.: room occupied.

Group business:

Room Occ. = -4.17 + 0.43ADR + 0.54 Room $Occ._{t-1}$ + ε.
(3.18) (0.25) (0.05)
[-1.31] [1.71]* [11.75]

( ) and [ ] stands for standard error and t-statistic respectively.
R^2: 0.31. F-statistic: 72.37. ADR: Average Daily Rates. Room Occ.: room occupied. *: significant at 10%

Individual business:

Room Occ. = 3.13- 0.16 ADR + 0.59Room $Occ._{t-1}$ + ε.

(1.67) (0.13) (0.04)

[1.87] [-1.23] [15.77]

( ) and [ ] stands for standard error and t-statistic respectively.

R^2: 0.35. F-statistic: 126.61. ADR: Average Daily Rates. Room Occ.: room occupied.

Group Leisure:

Room Occ. = -5.29 + 0.51ADR + 0.63 Room $Occ._{t-1}$ + ε.

(1.67) (0.13) (0.04)

[-3.17] [3.78]*** [17.03]

( ) and [ ] stands for standard error and t-statistic respectively.

R^2: 0.43. F-statistic: 158.30. ADR: Average Daily Rates. Room Occ.: room occupied. ***: significant at 1%

Individual Leisure:

Room Occ. = 2.97–0.16ADR + 0.76 Room $Occ._{t-1}$ + ε.

(1.62) (0.12) (0.03)

[1.83] [-1.33][26.00]

( ) and [ ] stands for standard error and t-statistic respectively.

R^2: 0.58. F-statistic: 339.27. ADR: Average Daily Rates. Room Occ.: room occupied.

3.4 Short-term and long-term elasticity results

Using (6a) and (6b) the results of short-term and long-term price elasticity of room demand as follows:

Table 4. Short-term and Long-term Elasticity Result

Variables	Short-term elasticity (6 a)	Long-term elasticity (6 b)
All data	0.04	.10
High season	0.28	.51
Low season	-0.0002	-0006
Group business	0.43	.93
Individual business	-0.16	-0.39
Group Leisure	0.51	1.38
Individual Leisure	-0.16	-0.67

3.5 Estimation of optimal room rates

Formula (7) was run to obtain optimal room rates of MBLH. Due to the nature of formula (7) only negative coefficients of ADRs could be applied to estimate the optimal room rates. Segment wise this study found two segments with negative signs of ADR coefficients, individual business and individual leisure with the magnitude of -0.16 for both.

Optimal room rates for individual business and leisure:

$$r = \frac{1}{2}\left[\left(1-\frac{1}{\beta}\right)r_0 + v\right]$$

Since there were three classes of room rates then the optimal room rate would be:

Price 1 was charged at Rp 576.000 with variable room expense was at Rp.69.100.

Optimal room rate would be at Rp2.122.550.

Price 2 was charged at Rp 633.600 with variable room expense was at Rp82.273

Optimal room rate would be at Rp2.337.937.

Price 3 was charged at Rp 748.800 with variable room expense was at Rp 94.378.

Optimal room rate would be at Rp2.761.589

3.6 Discussion of the results

Maximizing room revenues is one of the strategic objectives that should be achieved by a hotel. It is common knowledge that room revenues contribute up to 70 % of a hotel's total revenues. By maximizing room revenue, it was hoped that the bottom line of a hotel would also increase. To be able to conduct a room revenue management in a sound way it is imperative for hotel management to have a good quality of room bookings data and sophisticated forecasting techniques.

For MBLH the following empirical results were found. The movements of room demand (occupancy) for 487 daily observations for all data were relatively volatile. This could be easily analyzed by its minimum and maximum of room demands. There was a 153 range from minimum to maximum of room demands. Another point should be noted that the standard deviation for room occupancy was 36 while its mean was 99 rooms. The room occupancy was highly volatile since it departed from its mean by36 %. On the part of ADR, the MBLH hotel experienced high volatile with 14 % against its standard deviation. Segment individual business is highly volatile in terms of room occupancy and ADR, followed by group and individual leisure. These facts lead to a condition that management of MBLH should be very careful in offering room rates and other features to its potential guests.

Regression results reveal the following for price elasticity of room demands. The coefficient of price elasticity is +0.04 for all data, it is statistically insignificant. Segments revealed the following findings. Group business coefficient elasticity is + 0.43 with $p< 10\%$. Individual business's elasticity is -0.16 though statistically insignificant. Group leisure elasticity is +0.51 with $p< 1\%$, while individual leisure coefficient of elasticity is -0.16; yet statistically insignificant with $p> 10\%$. In the short-term, as economic theory stipulated the market for room demands is in disequilibrium. In the long run market for room demand will move to equilibrium condition. For the MBLH case, in the long run for all data the disequilibrium room demand would be corrected by 0.10 each period. Segment for group business would be corrected 0.93 while for individual business would be -0.39. The speed of adjustment for group leisure was very swift with 1.38 times for long-term equilibrium while on the other hand for individual leisure it would take -0.67 each period. Using optimal price formula this study found that the MBLH offered its room rate at one quarter of its potential or optimal price. This decision was taken among other factors due to tight competition in the hotel industry in Bali. Yet, on the other hand too low price would lead the payback period of the investment getting longer and may bring the investment to a riskier situation. Empirical evidence for price elasticity of room demand for MBLH, a four-star hotel; showed that it was in a price inelastic condition. This fact supported by the coefficient of elasticity for all data was +0.04 which is less than 1. If we refer to table 1 on the previous page, the highest price was IDR 769452, while the lowest was IDR 248188; and its mean was IDR 395000. Segment wise only individual business and individual leisure had negative signs, yet their smaller than 1. This finding showed that only individual business and individual leisure were price sensitive. The conditions on price inelasticity for MBLH tend to support that when the prices offered were lower or below the quality perceived by the potential guests, they would not be price sensitive. They tend to just accept the prices offered.

4. Conclusion

The price elasticity of room demand for all data of the MBLH hotel was +0.04, statistically insignificant. This magnitude of price elasticity of room demand is less than 1 leads to a situation that it is in a price inelastic situation. Given the season, high season was price inelastic at +0.28 with $p>10\%$ while for low season it was -0.0002 with $p>10\%$. For all season, the price elasticity of the MBLH hotel is inelastic. Given the guest segments, all segments in the MBLH hotel exhibited inelastic price elasticity situation with different magnitudes for its price elasticity.

Using formula (7) in the previous page, this study found that the prices charged to the MBLH hotel guests, a 4-star hotel; was far below their potential prices.

The managerial implications of this study are the following. First, that the management of MBLH hotel should design its room rate structures in such a way that could capture the dynamics of the seasons and guest segments. Second, that the management of MBLH hotel should review its policy on marketing especially on room rates contracts with all of its partners.

This study by design has two limitations. First, it was only a case study. The findings of this study are applicable only for the MBLH hotel and thus they cannot be generalized for hotels in Bali. Second, the length of daily observation covered only for 488 daily observations. It needs a longer daily observation to achieve a better result.

Based on those limitations it is strongly suggested to conduct a similar study covering all classes of hotels all over Bali province with longer daily observations.

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