# The Determinants Affecting to ADR of City Hotels in Thailand

# ตัวแปรที่มีผลต่อราคาห้องพักเฉลี่ยต่อวันของโรงแรมในเมืองในประเทศไทย

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**Abstract**

The aim of this research is to identify the difference of the determinants which affect to the ADR (Average Daily Rate) of the hotels in Bangkok and the city hotels in other provinces. Hedonic Price Modeling was applied to analyze the determinants, where ADR was the dependent variable and the independent variables were derived from literature review or suggested by an expert panel. Factor analysis was then adopted to merge the high correlation independent variables. The data from 461 hotels in Bangkok and 335 hotels in provincial city hotels in all regions of Thailand were collected from www.agoda.com which is the most popular hotel reservation website in Thailand. The results showed that several determinants are significant in both groups of hotels, e.g. star rating, some hotel facilities, and room size, but there are some determinants being significant only in Bangkok such as location overview, distance to airport, and hotel's brand. In addition, the distance from CBD (Central Business District) and the hotel's region is significant only in provincial city hotels. The results can clarify the characteristics of the city hotels in Thailand and can be used in the investment and development decision making of the hotel developers in Thailand. Furthermore, the acquired ADR prediction models for hotels in Bangkok and city hotels in other provinces can provide useful information for investors or developers regarding hotel value appraisal, or pricing hotel's room rates.

*Keywords:* Average Daily Rate (ADR), City Hotel, Hedonic Price Model

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## 1 Introduction

According to Ministry of Tourism and Sports (2007), city hotel is business-objective place for temporary accommodation service which charge in daily basis. They are located in city area and focus on room facilities for serve businessmen and tourists. Bangkok is the capital of Thailand and one of the famous world's travel destinations, according to Tripadvisor.com (2015). Normally, the revenue which is generated from hotels in Bangkok is the biggest portion, or about 29.96% of total hotel's revenue in Thailand (National Statistical Office, 2013). Data from agoda.com (2014) showed that there were about 901 three-to-five-star hotels in Bangkok while there are 689 three-to-five-star city hotels in other provinces of Thailand, comprising 217 hotels in the North (38.14%), 187 hotels in the North East (32.86%), and 165 hotels in the other regions (the Central, the East, the West, and the South) (29.00%).

In addition, the information form Annual Registration Statement (56-1 Form) from 2012 to 2014 of five Thai listed hospitality companies in Stock Exchange of Thailand, i.e. Central Plaza Hotel Public Company Limited, Dusit Thani Public Company Limited, Grande Asset Hotels and Property Public Company Limited, Royal Orchid Hotels (Thailand) Public Company Limited and Shangri-La Hotel Public Company Limited, informed that room revenue had contribution of more than 50% of total revenues. According to the survey of Thailand's National Statistical Office (2013), room revenues of hotels in all regions of Thailand were about 67.20%. From literature review, it was found that room revenue directly affects hotel's value when it is appraised by income approach, which is widely adopted in hotel value appraisal because the value is reflected from its future net cash flow (Raleigh and Roginsky, 1999). Furthermore, an important indicator for evaluating hotel revenue is Average Daily Rate (ADR), which is calculated in a specific time basis such as daily, monthly, quarterly, or yearly in Baht (Thailand's currency) per room per night. ADR can be calculated from the following formula: (Raleigh and Roginsky, 1999).

$$ADR = \frac{Room\ Revenue}{Number\ of\ Room\ Sold} \quad (1)$$

From the large number of city hotels and the importance of ADR, this research is aimed to find the determinants which affect to ADR in city hotels and analyze the different characteristics between hotels in Bangkok and other provinces. Moreover, the ADR prediction models were then tested and proposed. Reviewing several former research works concerning hotel's prediction models in several regions around the world, such as White and Mulligan

(2002), Israeli (2002), Monty and Skidmore (2003), Chen and Rothschild (2010), Andersson (2010), and Abrate, Capriello and Fraquelli (2011), it can be concluded that the hotels of different regions are probably have different significant determinants, as well as the prediction models are not much accurate for predicting the revenues of city hotels in Thailand. The findings of the research have several expected contributions. The hotel investors and developers can use the acquired determinants and their correlation coefficients, as well as the ADR prediction models, as supporting data in making decisions for several key business operations such as project feasibility study, pricing the room rates, hotel value appraisal, and hotel renovation for higher room rates. Finally, academic is also beneficial from the acquired determinants and ADR prediction models applicable to city hotels in Thailand as one of the usable sources of information for further research.

**2 Data and Methodology**

Hedonic Price Model is adapted to find out significant determinants. It is the goods' implicit price model derived by using Multiple Regression Analysis (Rosen, 1974). Several researchers adopted this method to analyzed hotels' ADRs. For example, White and Mulligan (2002) studied 584 hotels in four states in United Stated, i.e. 1) Arizona, 2) Colorado, 3) New Mexico, and 4) Utah, and proposed linear-form models with 0.570 - 0.583 Adjusted $R^2$ values. There were four significant determinants in the models: 1) hotel's brand, 2) average room size, 3) CBD location, and 4) location in travel destination. In Israel, Israeli (2002) found three significant determinants from 215 hotels and linear-form models were proposed with 0.620-0.820 Adjusted $R^2$ values. Moreover, Monty and Skidmore (2003) studied fifteen bed and breakfasts in Wisconsin, USA and the best fit models were proposed with natural log-linear form with 0.605 – 0.714 Adjusted $R^2$ values and there were three significant determinants: 1) location attributes, 2) increasing weekend price from week day price, and 3) increasing price during travel-season. In next four years, Thrane (2007) collected data from 74 hotels in Oslo, Norway and reported the best fit models in log-linear form with 0.703 - 0.705 Adjusted $R^2$ values. Moreover, it was found that room rates were affected from some of physical attributes: the availabilities of minibar, hair dryer, room service, and free parking. However, hotel brand and distance from city center were also significant. Another research in Italy, Abrate, Capriello and Fraquelli (2011) studied 140 hotels in Turin and found that the best fit model was natural log-linear form with 0.780 Adjusted $R^2$ value and two significant determinants were 1) star rating and 2) hotel's facilities.

In Asia, Chen and Rothschild (2010) collected data from 73 hotels in Taipei and proposed log-linear models with 0.681 - 0.703 Adjusted $R^2$ values. There were four significant

determinants in this research: 1) hotel's brand, 2) average room size, 3) hotel's facilities, and 4) CBD location. Andersson (2010) collected data from 69 hotels in Singapore and the natural log-linear model with 0.892 Adjusted $R^2$ value was proposed. The significant determinants were classified into 3 groups, i.e.1) hotel's attributes, 2) customer's satisfaction, and 3) location's attributes.

**2.1 Methodology**

This research analyzed the city hotels' price determinants and ADR by Hedonic Price Model deriving methodology. The inputs were the ADR and the hotels' attributes as the dependent variable and the independent variables, respectively. According to Halvorsen and Pollakowski (1981), there is no general model form for Hedonic Price Model. However, model forms usually proposed in the previous research works are listed below:

1. linear-linear form,
2. log-linear form, transforming dependent variable by taking logarithm,
3. linear-log form, transforming independent variables by taking logarithm,
4. log-log form, transforming both of variables by taking logarithm.

For Multiple Regression Analysis, multicollinearity problem will be occurred when any pair of independent variables has correlation more than 0.75 (Prasith - rathsint and Sukkasem, 1993). In addition, Variance Inflation Factor (VIF) is one of the effective multicollinearity investigating indicators. The value of VIF of each selected independent variable should not more than 10 (Prasith-rathsint and Sukkasem, 1993; Wanitbancha, 2003; Panichwong, 2002). Moreover, there are four statistical criteria to determine the best fit model, as presented in Table 1.

Table 1: Statistical Criteria for the Best Fit Model

| Statistical Criteria | Condition | Statistical Meaning |
|---|---|---|
| Sig. Values of Independent Variables | All variables have t-test significance values not less than 0.05 | All variables in the model are significant. |
| Adjusted $R^2$ | As much as possible | The higher the value is, the closer the data are to the expectations of the regression model. |
| VIF | Not more than 10. | No multicollinearity of the independent variables. |

| | | |
|---|---|---|
| Residual | 1. Residuals are normally distributed.<br>2. Residuals' mean is equal to zero.<br>3. There is no heteroscedasticity problem.<br>4. No relationship between each residual. (Durbin-Watson Statistic is between 1.50 to 2.50) | All conditions of the residuals from Multiple Regression Analysis are satisfied. |

Furthermore, Stepwise Regression Method was applied in order to select independent variables into the models. It will analyze the previous inserted variables and the last inserted variable together when a new variable is inserted into the models.

Finally, the adopted models were tested by Pair-sample t-test and Theil's U Test with the data of 73 hotels in Bangkok and 56 provincial city hotels, which had not been used in the Multiple Regression Analysis process. Pair-sample t-tests compared the mean of the observed ADRs and the mean of the ADRs calculated from the models at 0.05 significance level in order to verify the accuracy of the models, while Theil's U Test will give value between 0 and 1 when the examined model is accurate or, on the other hand, the value more than 1 will inform the examined model is inaccurate. The less value the test shows, the more accurate the examined model can predict the dependent variable (Makridakis, Wheelright and McGee, 1983).

**2.2Hypothesis**

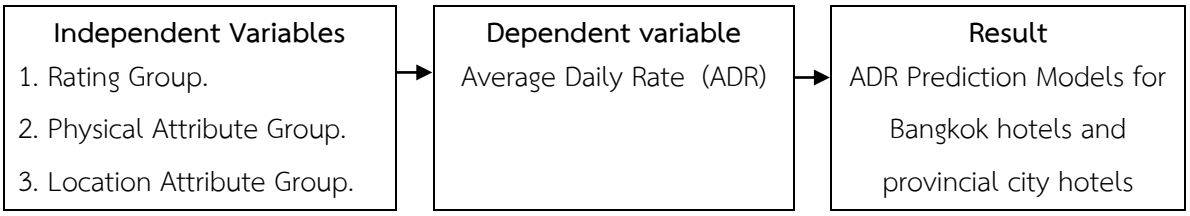
According to the literatures mentioned above, there are seven significant determinants, which can be classified into three groups as presented in Table 2.

Table 2: Summary of Significant Determinants from Literatures

| Group | Determinant |
|---|---|
| Rating | 1. Star Rating |
| | 2. Hotel's Brand |
| Physical Attributes | 3. Amount of Rooms |
| | 4. Average Room Size |
| | 5. Hotel's Facilities |
| Location Attributes | 6. CBD Location |
| | 7. Distance from Travel Destination to Hotel |

The research framework presented in Figure 1 establishes hypotheses that each independent variable (rating variables, physical attribute variables, and location attribute variables) has effect on the dependent variable, or ADR of the city hotels in Thailand.

Figure 1: Research's Variable Framework




**2.3 Data**

As mentioned above, there were three groups of the research independent variables: 1) rating, which the authors put "R" in front of the variables' names, 2) physical attributes, which authors put "P" in front of the variables' names, and 3) location attributes, which authors put "L" in front of the variables' names. All variables were verified by thirteen experts, who were high-level managements in hotel business with more than five-year experiences, before the researchers began to collect the required data. The experts' details are presented in Table 3.

Table 3: Experts' Details

| No. | Role | Organization | Number of Responsible Hotels |
|---|---|---|---|
| 1 | Management in Sale and Marketing | Listed Company in Hotel Business | 5 |
| 2 | Management in Finance | Listed Company in Hotel Business | 26 |
| 3 | Management in Business Development | Listed Company in Hotel Business | 16 |
| 4 | President | Sale and Marketing Consultant | 4 |
| 5 | Management in Finance | Listed Company in Hotel Business | 5 |
| 6 | Management in Operation | Company in Hotel Business | 5 |
| 7 | Management in Finance | Listed Company in Hotel Business | 11 |
| 8 | Management in Marketing | Listed Company in Hotel Business | 4 |

| | | | |
|---|---|---|---|
| 9 | Hotel's Owner | Stand Alone Hotel | 2 |
| 10 | Hotel's Owner | Stand Alone Hotel | 1 |
| 11 | Hotel's Owner | Stand Alone Hotel | 1 |
| 12 | General Manager | Stand Alone Hotel | 1 |
| 13 | Hotel's Owner | Stand Alone Hotel | 1 |

After the variable list was verified by the experts, 19independent variables for hotels in Bangkok and 21 independent variables for provincial city hotels were retained for the analysis process. They can be classified into dummy variables and scale variables. Dummy variables would be "0" if the hotel has not the computing attribute and be "1" if hotel has the attribute. Furthermore, all dummy variables have to be standardized before performing Multiple Regression Analysis. The details of the independent variables of the prediction models are presented in Table 4.

Table 4: Summary of Independent Variables

| Group | No. | Variable | Definition | Measure | Bangkok Hotels | Provincial city hotels |
|---|---|---|---|---|---|---|
| Rating | 1 | R_Star3 | Three-Star hotel (Yes or No) | Dummy | ✓ | ✓ |
| | 2 | R_Star4 | Four-Star hotel (Yes or No) | Dummy | ✓ | ✓ |
| | 3 | R_Brand | Managed or Franchised by International Brand (Yes or No) | Dummy | ✓ | ✓ |
| Physical Attributes | 4 | P_Nrm | Number of rooms | Scale | ✓ | ✓ |
| | 5 | P_Rmsize | Average Room Size (sq.m.) | Scale | ✓ | ✓ |
| | 6 | P_Staff | Agoda's Staff Score | Scale | ✓ | ✓ |
| | 7 | P_Room | Agoda's Room Standard Score | Scale | ✓ | ✓ |
| | 8 | P_Outlet | Number of Outlet in Hotel | Scale | ✓ | ✓ |
| | 9 | P_Pool | Swimming Pool Availability (Yes or No) | Dummy | ✓ | ✓ |
| | 10 | P_Fitness | Fitness Availability (Yes or No) | Dummy | ✓ | ✓ |
| | 11 | P_Spa | Spa Availability (Yes or No) | Dummy | ✓ | ✓ |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 12 | P_Recrea | Others Recreation (Such as Tennis, Squad etc.) Availability (Yes or No) | Dummy | ✓ | × |
| | 13 | P_Rs | Room Service Availability (Yes or No) | Dummy | ✓ | ✓ |
| | 14 | P_Interne t | Free Internet in Room Availability (Yes or No) | Dummy | ✓ | ✓ |
| | 15 | P_Meet | Meeting Room Availability (Yes or No) | Dummy | ✓ | ✓ |
| Location Attributes | 16 | L_CBD | Located in CBD (Yes or No) | Dummy | ✓ | ✓ |
| | 17 | L_Ovw | Agoda's Location Score | Score | ✓ | ✓ |
| | 18 | L_BMRT | Distance from Hotel to Bangkok Mass Rapid Transit (km.) | Score | ✓ | × |
| | 19 | L_Airport | Distance from Hotel to Airport (Km.) | Score | ✓ | ✓ |
| | 20 | L_N | Located in North Region of Thailand (Yes or No) | Dummy | × | ✓ |
| | 21 | L_S | Located in South Region of Thailand (Yes or No) | Dummy | × | ✓ |
| | 22 | L_NE | Located in North East Region of Thailand (Yes or No) | Dummy | × | ✓ |
| | 23 | L_CEW | Located in Central or East or West Region of Thailand (Yes or No) | Dummy | × | ✓ |
| Total Independent Variables | | | | | 19 | 21 |

To prevent multicollinearity problem, the correlation values of all independent variables were tested. It was found that a pair of variables for hotels in Bangkok, P_Staff (Agoda's staff performance score) and P_Room (Agoda's room standard score), had correlation value of 0.797, more than 0.750 suggested by Prasith-rathsint and Sukkasem (1993). These two variables were merged into one variable by Factor Analysis. The component score of P_Staff

and P_Room was 0.528 with 0.500 Kaiser-Meyer-Olkin (KMO) value. The merged variable's name is P_StfRm. After merging the correlate variables, the final number of independent variables becomes 18.

Depending on the same method, a pair of variables for provincial city hotels had correlation value of 0.879 and they were merged into one variable by Factor Analysis. These variables were P_Staff (Agoda's staff performance score) and P_Room (Agoda's room standard score). The component score of P_Staff and P_Room was 0.516with 0.500 Kaiser-Meyer-Olkin (KMO) value. The merged variable's name is P_StfRm. After merging the correlate variables, the final number of independent variables becomes 20.

It also should be noted that the distance variables, i.e. L_BMRT and L_Airport, were measured by Google Map and Agoda's score variables, i.e. P_Staff, P_Room and L_Ovw were scored by customers who booked each hotel via www.agoda.com.

**2.4 Source of Data**

In 2012, Thai Hotel Association rated 53hotels in Bangkok into 21 five-star hotels, 24 four-star hotels, and 8 three-star hotels. Furthermore, they rated 36 provincial city hotels into 4 five-star hotels, 19 four-star hotels, and 13 three-star hotels (Thai Hotel Association, 2012). However, the number of hotels from this source was too small for performing Multiple Regression Analysis, which requires at least five samples for one independent variable, as suggested by Bartlett, Kotrlik, and Higgins (2001). From this method, the data from 461hotels in Bangkok (70 five-star hotels, 158 four-star hotels, and 233 three-star hotels) and 335 provincial city hotels (12five-star hotels, 88 four-star hotels, and 235 three-star hotels) which cover all of regions in Thailand, as presented in Table 5, were collected from Agoda.com (www.agoda.com), the most popular hotel reservation website in Thailand (www.alexa.com, 2014). From the authors' exploratory survey by comparison between hotel ratings of Thai Hotel Association (2012) and Agoda.com, it was found that 94.38% (84 from 89 hotels) of the hotels were rated in the same level, showing that the data from Agoda.com has enough validity for being used in this research. As to the number of data collected in the research, the actual sample size was more than the minimum sample size of 90 samples for hotels in Bangkok and 100 samples for provincial city hotels, which are number of independent variables multiplied by 5 (number of samples per one variable). The actual ratio of the acquired sample size and the number of independent variables became 25.61 and 16.75, which were 461 divided to 18 and 335 divided to 20, respectively.

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The physical and location attribute data of the sample hotels were collected from their public information such as hotel's website, online travel agent website, and hotel's staff. In addition, an ADR of a hotel was calculated from its average twelve month room rate of all room types available in Agoda.com. In order to control the effect of the period on the hotels' ADRs, all pieces of data were collected during September to December 2014.

Table 5: Numbers of City Hotels Classified by Locations and Ratings

| Region | Province | No. of Hotels | | | |
|---|---|---|---|---|---|
| | | 5 Star | 4 Star | 3 Star | Total |
| North | Chiang Mai | 8 | 34 | 81 | 123 |
| | Chiang Rai | - | 10 | 1 | 11 |
| | Lampang | - | 1 | 2 | 3 |
| | Nakhon Sawan | - | 2 | - | 2 |
| | Nan | - | 2 | - | 2 |
| | Phitsanulok | - | 1 | 4 | 5 |
| | Tak | - | 2 | - | 2 |
| | Phayao | - | - | 2 | 2 |
| North East | Nakhon Ratchasima | 2 | 1 | - | 3 |
| | Khon Kaen | 1 | 6 | 36 | 43 |
| | Buri Ram | - | 5 | 7 | 12 |
| | Mukdahan | - | 1 | - | 1 |
| | Udon Thani | - | 3 | 17 | 20 |
| | Ubon Ratchathani | - | 1 | 2 | 3 |
| | Loei | - | 1 | - | 1 |
| | Nakhon Phanom | - | 1 | 5 | 6 |
| | Nong Khai | - | 1 | 10 | 11 |
| Middle and East | Chon Buri | 1 | - | 12 | 13 |
| | Ayutthaya | - | 2 | - | 2 |
| | ChanthaBuri | - | 1 | 1 | 2 |
| | KanchanaBuri | - | 2 | 1 | 3 |
| | Rayong | - | 3 | 10 | 13 |
| | Nakhon Pathom | - | 1 | - | 1 |
| | Suphan Buri | - | - | 2 | 2 |

| | | | | | |
|---|---|---|---|---|---|
| | Trat | - | - | 1 | 1 |
| South | Chumphon | - | 1 | 8 | 9 |
| | Songkhla | - | 2 | 1 | 3 |
| | Krabi | - | 1 | 9 | 10 |
| | Narathiwat | - | 1 | - | 1 |
| | Trang | - | 1 | - | 1 |
| | Ranong | - | 1 | - | 1 |
| | Surat Thani | - | - | 6 | 6 |
| | Phuket | - | - | 17 | 17 |
| Total | | 12 | 88 | 235 | 335 |

**3 Results and Discussion**

From the analysis, log-linear form model gained0.843 Adjusted $R^2$value for the hotels in Bangkok and 0.749 Adjusted $R^2$ value for the provincial city hotels, which was the highest values among all forms of models of both types of hotels, and all statistical criteria mentioned in Table 1 were satisfied. The Adjusted $R^2$ values of all models are presented in Table 6. According to Stepwise Regression Method, the variable with the highest correlation coefficient was first inserted into the models and the variable with the next highest coefficient was the next order to be inserted. The process was repeated until all variables were inserted into the models. The regression result showed that there were eleven independent variables that are significant at 95% confidence level, of which their Descriptive Statistic results are shown in Table 7 and Table 8. The other independent variables which were not significant at 95% confidence level or,in other words, cannot improve Adjusted $R^2$ value when being added to the models, were finally deleted from the models.

Table 6: Adjusted $R^2$ of All Models

| Model Form | Adjusted $R^2$ | |
|---|---|---|
| | Hotels in Bangkok | Provincial City Hotels |
| Linear | 0.759 | 0.711 |
| log-linear | 0.843 | 0.749 |
| linear-log | 0.729 | 0.650 |
| log-log | 0.834 | 0.736 |

Table 7: Descriptive Statistic of Significant Variables in the Best Model for Hotels in Bangkok

| Variables | Coefficient | Std. Error | t-Statistic | Sig. | Collinearity Statistic: VIF |
|---|---|---|---|---|---|
| Constant | 2.217 | 0.063 | 35.058 | 0.000 | |
| R_Star3 | -0.107 | 0.011 | -9.762 | 0.000 | 0.171 |
| R_Star4 | -0.057 | 0.008 | -6.843 | 0.000 | 0.297 |
| P_StfRm | -0.056 | 0.008 | 7.435 | 0.000 | 0.528 |
| P_Rmsize | 0.003 | 0.000 | 10.092 | 0.000 | 0.671 |
| P_Outlet | 0.020 | 0.003 | 6.574 | 0.000 | 0.580 |
| L_Ovw | 0.049 | 0.007 | 6.975 | 0.000 | 0.606 |
| P_Fitness | 0.024 | 0.007 | 3.633 | 0.000 | 0.458 |
| L_Airport | 0.004 | 0.001 | 4.229 | 0.000 | 0.889 |
| R_Brand | 0.018 | 0.006 | 3.211 | 0.001 | 0.660 |
| P_Pool | 0.018 | 0.006 | 2.891 | 0.004 | 0.523 |

Table 8: Descriptive Statistic of Significant Variables in the best model for Provincial City Hotels

| Variables | Coefficient | Std. Error | t-Statistic | Sig. | Collinearity Statistic: VIF |
|---|---|---|---|---|---|
| Constant | 2.326 | 0.070 | 33.068 | 0.000 | |
| R_Star3 | -0.181 | 0.019 | -9.316 | 0.000 | 0.119 |
| R_Star4 | -0.123 | 0.018 | -6.807 | 0.000 | 0.137 |
| P_StfRm | 0.069 | 0.009 | 7.849 | 0.000 | 0.942 |
| L_NE | -0.066 | 0.007 | -9.551 | 0.000 | 0.942 |
| P_Pool | 0.046 | 0.008 | 5.997 | 0.000 | 0.773 |
| L_CBD | 0.018 | 0.007 | 2.661 | 0.008 | 0.957 |
| P_Rmsize | 0.007 | 0.001 | 9.991 | 0.000 | 0.724 |

As to the other statistical values for Multiple Regression Analysis, the acquired models comply with the mentioned criteria, as the results shown in Table 9. The scatter plot between the residuals and the predicted ADRs from the models is free dispersed, informing that the predicted ADRs do not depend on the residuals and the models do not have heteroscedasticity problem.

Table 9: Statistical Test Results of the Best Models

| Statistical Test | Result | |
|---|---|---|
| | Hotels in Bangkok | Provincial City Hotels |
| Model form | log-linear | log-linear |
| Adjusted $R^2$ | 0.843 | 0.749 |
| VIF of all variables (less than 10) | Yes | Yes |
| Residual Analysis | | |
| 1. Normally distributed. | Yes | Yes |
| 2. Mean is equal to zero. | Yes | Yes |
| 3. Do not have heteroscedasticity problem. | Yes | Yes |
| 4. No relationship between each residual. | Yes | Yes |
| (Durbin-Watson statistic is between 1.50to 2.50) | 2.059 | 2.811 |
| Number of independent variables | 10 | 7 |

Finally, the acquired model for hotels in Bangkok was shown in Equation 2, and the model for provincial city hotels was shown in Equation 3, respectively.

$$\log(ADR) = -0.107(R\_Star3) - 0.057(R\_Star4) + 0.049(L\_Ovw) + 0.056(P\_StfRm) + 0.024(P\_Fitness) + 0.020(P\_Outlet) + 0.018(P\_Pool) + 0.018(R\_Brand) + 0.004(L\_Airport) + 2.217 \quad [2]$$

$$\log(ADR) = -0.181(R\_Star3) - 0.123(R\_Star4) - 0.066(L\_NE) + 0.046(P\_Pool) + 0.069(P\_StfRm) + 0.018(L\_CBD) + 0.007(P\_Rmsize) + 3.180 \quad [3]$$

According to the models above, all dummy variables have to be replaced by the standardized values, as presented in Table 10 for the hotels in Bangkok and Table 11 for provincial city hotels, while the scale variables can be replaced with real values of each hotel.

Table 10: Replace Values of Dummy Variables for Hotels in Bangkok Model

| No. | Variable | Definition | Value for Yes | Value for No |
|---|---|---|---|---|
| 1 | R_Star3 | Three-Star hotel | 0.988 | -1.010 |
| 2 | R_Star4 | Four-Star hotel | 1.383 | -0.721 |
| 3 | P_Fitness | Fitness Availability | 0.863 | -1.156 |
| 4 | P_Pool | Swimming Pool Availability | 0.771 | -1.295 |
| 5 | R_Brand | Managed or Franchised by International Brand | 1.935 | -0.516 |

Table 11: Replace Values of Dummy Variables for Provincial City Hotels Model

| No. | Variable | Definition | Value for Yes | Value for No |
|---|---|---|---|---|
| 1 | R_Star3 | Three-Star hotel | 0.628 | -1.587 |
| 2 | R_Star4 | Four-Star hotel | 1.729 | -0.576 |
| 3 | L_NE | Located in North East Region of Thailand | 1.541 | -0.647 |
| 4 | P_Pool | Swimming Pool Availability | 1.055 | -0.945 |
| 5 | L_CBD | Located in CBD | 0.562 | -1.773 |

The pair sample t-test values of hotels in Bangkok and provincial city hotels are 0.153 and 0.597, at 0.05 statistical significance level. The results showed that the observed ADRs and the predicted ADRs from the proposed models are not significantly different, conforming to the Theil's U statistic value of 0.472 for hotels in Bangkok and 0.597 for provincial city hotels, showing that the proposed models are acceptably accurate.

According to the equations above, some variables were found in both of hotels in Bangkok and provincial city hotels. For example, star rating, staff performance, room quality, and etc. The comparison of the significant variables is presented in Table 12.It was found that the most three significant variables for both hotel groups were the same. However, they were different in their orders of significance.

Table 12: Comparisons of Significant Variables

| No. | Hotels in Bangkok | | Provincial City Hotels | |
|---|---|---|---|---|
| | Variables Definition | Coefficient | Variables Definition | Coefficient |
| 1 | 3 Star Hotel | - 0.175 | 3 Star Hotel | - 0.181 |
| 2 | 4 Star Hotel | - 0.057 | 4 Star Hotel | - 0.123 |
| 3 | Agoda's Room Standard Score and Staff Score | 0.056 | Agoda's Room Standard Score and Staff Score | 0.069 |
| 4 | Agoda's Location Score | 0.049 | Located in North East Region of Thailand | - 0.066 |
| 5 | Fitness Availability | 0.024 | Swimming Pool Availability | 0.046 |
| 6 | Number of Outlet in Hotel | 0.020 | Located in CBD | 0.018 |
| 7 | Swimming Pool Availability | 0.018 | Average Room Size (sq.m.) | 0.007 |
| 8 | Managed or Franchised by International Brand | 0.018 | NA | NA |
| 9 | Distance from Hotel to Airport (Km.) | 0.004 | NA | NA |

The results show that the determinants affecting the ADRs of city hotels in Thailand both in Bangkok and in other provinces have different determinants, the availability of fitness center affects Bangkok hotels' ADRs but not affects provincial city ones while the availability of swimming pool affects provincial city hotels' ADRs but not affects Bangkok hotels' ADRs. In addition, city hotels' ADRs which located in the North East are lower than that of the hotels located in other regions. However, they have some same determinants but the effects of them were different.

To clarify the discussion, the research results were presented to hotel's business experts in order to verify and get some advantageous comments. For the reason that the hotels located in the North East have lower ADRs, the experts gave comments that the hotels in this region are often used for business objective and each travel destination is far away from another, where their tourists have to spend a lot of times to travel in this region.

Moreover, there are some interesting issues from comparison among the research results with the results of the previous research works. First, hotel's star rating is the most sensitive variable, conforming to Israeli (2002), because it implies to hotel's overall quality. Next, room standard and staff score are the next sensitive variables in both hotels group which are in accordance with some the related research works of the other service businesses which staff's service standard is a highly important factor for customer satisfaction such as coffee shop and commercial office building: Siangchin and Phasunon (2015) and Thongma and Phasunon (2014), respectively.

Furthermore, hotels' owners or managements can apply the research results to find the optimal balance between the room price and the hotel quality, which was proved by Hartman (1989) that it can increase hotel operating profit by improving the hotel's occupancy rate. In addition, the English training program which suggested by Taraporn et al (2014) can improve hotel staff's communication skill. It is a practical method to increase staff score which affect to ADR in equation above.

Finally, it should be noted that this research focuses mainly on revenue perspective. However, some independent variables which lead to the change in ADR can also cause the increasing of the investment or operating cost to entrepreneurs. Therefore, hotel entrepreneurs, as well as other research users, should realize this concern in applying the results of this research in the real world, in order to acquire the comprehensive perspective.

## 4 Conclusions

There are nine determinants affecting ADRs of hotels in Bangkok at 95% confidence level with 0.843 Adjusted $R^2$ value and seven determinants which affect ADRs of provincial city hotels at 95% confidence level with 0.749 Adjusted $R^2$ value whereas the highest effect variable of both hotel groups is star rating, conforming to Israeli (2002). Service and room comfortableness variable is the second effect variable of hotels in Bangkok while the North East location is the second effect variable for provincial city hotels. The research findings can give the very useful information to investors or hotel entrepreneurs in understanding the customers' satisfactory to each component of hotels, e.g. hotel rating, location, service, managed or franchised by international brand, room size, room standard, and staff standard. These pieces of information can support them in making effective decisions for their key business operations such as project feasibility study, pricing the room rates, hotel value appraisal, and hotel renovation for increasing room rates. Finally, academia are also beneficial from this research by using the research results, especially the determinants and the ADR prediction models applicable to city hotels in Thailand, as one of the usable sources of information for further research.

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