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The Luxury casino hotel dynamic price strategy practices for the FIT customer segment

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THE LUXURY CASINO HOTEL DYNAMIC PRICE STRATEGY PRACTICES

FOR THE FIT CUSTOMER SEGMENT

by

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ABSTRACT

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This research paper compares room rate luxury casino hotel pricing pattern between the periods of 4/1/2009 to 6/30/2009).

A good price strategy can help a hotel optimize both price and demand. The price strategy is also the only way a hotel can offset its demand in advance. Price strategy experienced several revolutions after the hotel industry adopted the Revenue management (RM) price strategy from the airline industry, which has changed it profoundly in the past decades. The RM price strategy is, more than ever before, a fundamental influence on RM practice. This is not only because of its financial point of view, but also because it is strongly related with all aspects of hotel management marketing strategies, such as forecasting demand, controlling the pace of booking, and understanding customer price elasticity.

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PART I

Introduction

Pricing strategy is always the most essential component for the hotel business, because the hotel industry has huge fixed costs and low variable costs, which means that cost control alone cannot optimize the profitability of a hotel. Applying a proper price strategy is the fastest and most effective way for a hotel to optimize its revenue (Kim, Han, & Hyun, 2004). A good price strategy can help a hotel optimize both price and demand. The price strategy is also the only way a hotel can offset its demand in advance. Price strategy experienced several revolutions after the hotel industry adopted the Revenue management (RM) price strategy from the airline industry, which has changed it profoundly in the past decades. The RM price strategy is, more than ever before, a fundamental influence on RM practice. This is not only because of its financial point of view, but also because it is strongly related with all aspects of hotel management marketing strategies, such as forecasting demand, controlling the pace of booking, and understanding customer price elasticity.

Purpose

Hotel companies sell a perishable service product, which means that hotel companies have no choice but to sell their products in advance because the products cannot be stored. This research will analyze the changes in room rates at different time periods in the 90 days before and on the date of arrival (DBA) to find out what price trends are currently used by hotels. The purpose of this article is to provide a method to illustrate hotel price strategy patterns for the FIT (free individual traveler)

segments during different DBA periods, to explore what price trends are adopted by three luxury casino hotels located on the Las Vegas Strip during a weekend in the second quarter of 2009, and to explore the similarities and differences in those price trends.

Justification

There are substantial research articles elaborating the practices and theories of price strategy and price patterns, and most academic researchers have pursued how demand change influences price decisions. However, most of the articles discussed price strategies in an ideal status and the price trends in a time series, while few of them analyzed real-world hotel price strategies, and no previous research has quoted and compared room rates by specific hotels for the same room type in the same time during different DBA. This paper will provide statistical evidence for that research. Since this research focuses on the price trends during weekends in the 2nd quarter in Las Vegas and since the room occupancy is close to 100% according to industry experience, this means the demand change influence on price changes can be ignored. RM managers of those hotels do not need to worry about occupancy, and thus can concentrate on managing the room rate itself. The results of this research may assist revenue managers in setting up a price strategy, and may provide researchers and educators material for further dynamic price research.

Constraints

The first major constraint of this paper is the limited quantity of quoted price data. Only one type of room, three hotels, and three months' worth of data are

included in this research. The second limitation of this research is that the DBA period may be not precise enough to illustrate price trends in detail. The third defect of this research is failing to consider that the hotel may not only change the price but may also offer promotions, such as offering free meals, property credit, or free upgrades, to customers who book earlier. Those three limitations may lead to a biased conclusion.

PART II

Literature Review

Introduction to Revenue Management

Revenue management, a method for managing capacity profitably, contains a variety of concepts and analytical tools. It has usually been used in various service industries to allocate limited resources, such as hotel rooms, restaurant tables, and airline seats among a variety of customers, like business or leisure travelers. Because it is used by firms with extremely perishable goods or by firms with services that cannot be stored at all, its concepts and tools are often called "perishable asset revenue management" or simply "revenue management" (Netessine & Shumsky, 2002).

Revenue management is also known as yield management, with the word being originally used in agriculture. A farmer always tries to maximize output or "yield" from a certain amount of land. The only way to increase output is to increase the yield from each acre of land, since the land area is ultimately fixed. The term can be easily adopted in other industries. It is a method that can help a firm to sell the right inventory unit to the right customers at the right time and at the right price, and thus to help a company optimize its profit. It leads to the decision of how to allocate indistinguishable units of capacity to the available demand in such a way as to optimize the revenue or profit, and helps executives to determine how much to sell, at what price, and to which market segment(Ingold & Yeoman, 1997).

Yield management attracted a great deal of attention from the airline industry in the 1980's because of the deregulation of the U.S. airline industry and the emergence of affordable computer technology at that time. The term "yield" in the airline industry refers to yield (or revenue) per average seat mile. Yield management was first applied by some major airline companies, such as American Airlines and United Airlines, in order to compete with People's Express, a newly emerged airline company. People's Express adopted a marketing strategy that offered customers low-price tickets with minimal amenities. Meanwhile, the major companies provided customers with innovative airfares, offering a few seats at comparatively lower price levels, but simultaneously keeping the other seats at high price level. These innovative fare products not only generated considerable revenue from unused capacity, but also raised the possibility that passengers who were going to fly anyway could shift to the new discount deals, by which the major companies had intended to draw additional customers. These airline companies explored two ways to control the risk of revenue dilution from this new product. First, airline companies offered deeply discounted tickets with restrictions (such as 21-day advance booking requirements) to limit their availability to travelers who could plan. Second, these airlines would sell only a limited number of seats at a discount rate. As a result, People's Express passengers switched to major airline companies and People's Express declared bankruptcy eventually. (Cross, Higbie, & Cross, 2009; Netessine & Shumsky, 2002). Thus, yield management became an enormously important innovation in airline industry, which helped American Airlines to generate $500

million per year in incremental revenue and helped Delta Airlines, which employed a similar system, to generate additional revenues of $300 million per year (Netessine & Shumsky, 2002). After the airlines were hugely successful with this strategy, the hotel industry started to adopt yield management, but revised into revenue management (Cross, 1997). Marriott International, a revenue management pioneer, increased profits at between $150 million and $200 million from its top line by using revenue management technology (Marriott & Cross, 2000). Moreover, Sanket and Bowman (2004) explored the fact that hotels typically gain 2 to 5% incremental revenue, but some hotels report gaining above 6% incremental revenue by using revenue management technology.

The Revolution of Price Strategies in RM

The revenue technologies have changed a lot in revenue management, and the Internet reservations and database systems have become more and more sophisticated, but price strategy as the most fundamental aspect of revenue management for optimizing revenue has not changed. Gu and Steed (2004) explained why price strategies are important to all hotels. In a 500-room hotel with a 70% annual occupancy, a revenue manager's increasing the average daily rate (ADR) by $1 would generate $127,750 in revenue. There are two kinds of pricing that are based on different viewpoints of researchers, cost accounting and the market. Each of them has its own strengths and weaknesses.

Cost-accounting-based price strategy

Before hotels adopted revenue management technology, the most popular strategy was cost-accounting based. The hotel industry has huge fixed costs and low variable costs, so if manager were to consider only the cost factor, hotels would use only fixed-rate price strategies. Kim, Han, and Hyun (2004) considered this kind of price strategy to be a cost-accounting based price strategy. Two cost-based pricing strategies were generally used in the hotel industry before revenue management technologies were applied. One strategy is the thumb approach, or the $1 per $1000 approach (Schmidgall, 2002), in which the room price is equal to 1/1000 of the investment price. For example, if a hotel developer invests $100 million to construct a 100-room hotel, each room should be priced at $1,000 ($100 million/100room x1/1000) per night. Another strategy uses the Hubbart formula (Arbel & Woods, 1991), in which the room rate equals the satisfied room revenue divided by the anticipated rooms sold, and satisfied room revenue is the cost of the hotel and the owner-desired profit. However, the owner-desired profit is not necessary for a hotel to optimize its revenue, and the goals of a hospitality firm may conflict with this price strategy (Gu, 1997). In addition, those two cost-based pricing strategies fail to consider market conditions, which are complex and competitive. Gu (1997) pointed out that the hotel industry needs a quadratic room-pricing model which should consider both operating costs and the market environment for the intensely competitive market.

Market-Based Price Strategy

Since cost-accounting-based price strategy has so many disadvantages, RM managers became interested in market-based price strategy, which considers market factors such as industry competition, demand, and price elasticity.

The law of demand is one of the market factors that market-based pricing must take into account. Adam Smith (1776), the founding father of economics, observed that as the price increases, the demand goes down (Figure 1). Based on this rule, RM managers change hotel room rates according to different demands. Relihan (1989) pointed out that room rates are adjusted according to the room demand for future arrival dates. Since different customers have differing customer behavior, RM managers divide their customer market into various segments. Boger, Cai and Lin (1999) pointed out that there are three major customer segments for hotels: business, leisure, and group. Most of the group customers have annual contracts with hotels, which are signed long before they arrive. The business and leisure travelers are categorized as FITs (free individual travelers). Business travelers usually make their reservations late, close to the time of the trip, and leisure travelers make reservations weeks or months in advance.

Boeffgen and Katach (2002) contended that hotels might make a large profit if they could exactly locate the optimal price differentiation between different customer segments. Choi and Mattila (2005) pointed out that revenue management makes giving different customers different prices more methodical than ever before. Those price strategies are discriminatory pricing, which uses dynamic price patterns and charge different prices for the same service to different market segments

(Monroe, 1979; Monroe, Della, & Bitta, 1978; Tellis, 1986). Using this strategy, RM managers may optimize the occupancy by increasing the price and choosing the most profitable mix of customers when they anticipate that demand will exceed capacity, and by decreasing the price and selling rooms to any customer when the anticipated demand falls behind the capacity. As a result, hotels that have different demands during different periods will charge different prices to different customers for the same hotel property, the same room, and even for the same customer (Choi & Mattila, 2005). Kotler, Bowen, and Makens (2002) pointed out that RM managers can separate customer segments because different customer segments have different value perceptions. Weatherford and Bodily (1992) stated that for perishable products, willingness to pay is expected either to increase or to decrease as the date of arrival draws closer.

Olearchik (2003) pointed out that more and more travelers use the Internet extensively to search for information and make lodging reservations. Travelers have become more sophisticated than ever before. Most of them have started looking for the best deals on the preferred hotel's Web site ahead of their date of arrival and have noticed that they are quoted different room rates at different times because of the lodging industry's dynamic pricing practice. Schwartz (2000) provided a theoretical model. He argued that the customer's willingness to pay as the date of arrival draws closer may increase due to the searching costs, and the customer who has a high searching cost shows more willingness to pay than the customer who has a lower searching cost. Mazumdar, Raj, and Sinha (2005) studied the reference price

theory to service-related perishable items and offered the conclusion that a previous price to which the customer has been exposed is the strongest factor in the consumer's formation of an internal reference price. Schwartz (2006) supplemented this theory and provided another model. The model illustrated the relationship between consumer exceptions, utility quoted room rates, and expected discount offers. He also believed that the exposure to changes in the quoted room rate over time can affect two advanced-booking decision variables, the customer's assessment of the likelihood of a sellout risk (ESR) and of the expected best offer, and can, consequently, influence consumers' booking decisions.

Fairness

Discriminatory pricing strategy is an efficient way to help hotels increase revenue. However, if customers discover that they are paying a higher price than other customers who have reserved the same type of room and received the same service, they may consider transactions as unfair and simply go elsewhere or not come back (Kim, 2002). Choi and Mattila (2005) pointed out that if the customer's fairness perceptions of revenue management are not well managed, the short-term profit of revenue management may ruin the long-term profitability of the hotel by its negative impact on customers.

Gabor and Granger (1986) conducted a survey to find the upper and lower price limits for certain products. They found that price can influence customers' quality expectations for the product or service. If the prices are above the upper limit, the customer may consider that the product is too expensive. If the prices are below the

lower limit, the customer may question the quality of the product. Zeithaml and Biter (1996) pointed out that price plays a considerable role in customers' formation of quality perception and their consideration of a transaction as fair or not, because of their reference price, which is the appropriate price that a customer thinks a given product or service should cost. Reference price is related to market price, rack rate, and experience with the hotel.

Lewis and Shoemaker (1997) provided a technique known as price sensitivity measurement (PMS) to determine whether a customer considers the transaction to be fair or not. RM managers should measure customers' price sensitivity in different market segments to find an acceptable price before setting a room rate. Kim (2002) pointed out that hotels should educate their customers about hotel revenue practices and should attach restrictions, such as booking a certain length ahead of time, when offering a discount price for a hotel room. Surveys conducted in 1992 show that customers are moderately willing to accept an increase in room rate if a reservation is made close to the DBA and will agree that other people who book earlier should get a cheaper price.

Hypotheses

In order to find out the price trends of those three hotels, there are 5 questions should be answered.

1. Is there any difference among average room rates of those three properties?
2. Would hotels use dynamic pricing strategy to charge different prices for the same room type to FIT customer during 3 main DBA periods?

3. If hotels are using dynamic pricing strategy, what are the price trends during those 3 main DBA periods for each hotel?

4. Would hotels use dynamic pricing strategy to charge different price for the same room type to FIT customer during 9 minor DBA durations?

5. If hotels are using dynamic price strategy, what are the price trends during those 9 minor DBA periods for each hotel?

Question 1, 2, and 4 can be revised two three hypothesizes.

Question 1: Are there any different among average room rates of those three properties?

$H1_0$: There is no difference among average room rates of those three properties.

$H1_{a:}$ There is difference among room average rates of those three properties.

Question 2: Would each hotel use dynamic pricing strategy to charge different price for the same room type to FIT customer during 3 main DBA periods?

$H2_{0:}$ The room rates are not different in those 3 main DBA periods for each property.

$H2_{a:}$ The room rates are different in those 3 main DBA periods for each property.

Question 3: Would hotels use dynamic pricing strategy to charge different price for the same room type to FIT customer during those 9 minor DBA periods?

$H3_{0:}$ The room rates are not different in those 9 minor DBA periods for each property.

$H3_{a:}$ The room rates are different in those 9 minor DBA periods for each property.

PART III

Data Collection

The price data were obtained on daily basis from hotel websites of Bellagio, Caesars Palace, and Wynn by the Business Intelligence department of Harrah's Entertainment. The data set consists of daily lowest check-in rate of the cheapest room type during 90 days advance period for each hotel, because FIT customer usually is the major market going for the cheapest room. The selected room type for each hotel property is as following:

Bellagio - Deluxe Room

Caesars Palace - Classic Room or Roman Tower Room

Wynn - Resort King Room

Methodology

Different hotels usually set different prices for different customer segments and different room types, so it is hardly possible to find a common rule which could be related to all customer segments. This paper will focus on the FIT (Free Independent Traveler) price strategy of luxury casino hotels located on Strip in Las Vegas.

The research examined the rate on Day of Arrive (DOA) during weekends (Friday and Saturday) between April and June in 2009. The sample period was selected because the second quarter is traditionally regarded as a good season for Las Vegas tourism, and hotels are easy to got high occupancy during the weekend, which will help this research diminish the impact on room rate from the demand change.

The 90 Days before Arrive (DBA) period was separated into 3 main periods (0-30DBA, 31-60DBA, and 61-90DBA) and each main period was separated into 3 minor 10-days periods. The 0-30DBA main period contains 1-10DBA, 11-20DBA, and 21-30DBA minor periods. The 31-60DBA main period contains 31-40DBA, 41-50DBA, and 51-60DBA minor periods. The 61-90DBA main period contains 61-70DBA, 71-80DBA, and 81-90DBA minor periods.

The Statistical Package for the Social Sciences (SPSS), Version 17.0, was used to conduct ANOVA test to determine whether data variance were statistically significant. SPSS also provided the cumulative distributions, which is necessary to present the graph of price trends.

Microsoft excel 2003 was used to organize data and analysis data average and variance. Microsoft excel 2003 also provided the cumulative distributions, which is necessary to present the graph of price trends.

One way –ANOVA was conducted to test the significance of the relationships involved. In addition for three hypotheses, Bonferroni Multiple Comparisons was followed in order to compare individual difference.

Means Plots chart were used to help readers visualize the price trends in each DBA periods.

Discussion and result

The following pages provide a detailed description of the data analysis. The variances were tested at a 0.05 Confident Interval for ANOVA test.

For this study, the weekends room price of 3 luxury casino hotels located in Las Vegas Strip were studied during 3-month 90 days advance period for each hotel. There are 26 weekend days during those 3 months. The room type of each property for this study is the cheapest one in those properties as following:

Bellagio - Deluxe Room

Caesars Palace - Classic Room or Roman Tower Room

Wynn - Resort King Room

Table 1 General information

The day of weekends defined in this study: Friday, Saturday

Study periods: 2nd quarter of 2009 (April 2009, May 2009, and June 2009)

Days involved in the study period: 26 days

How many DBA (Days before Arrival) price for each arrive days in each property: 91

Total DBA price for each property: 2366

Average sell out price

Table 2 The Statistic Description of the Price Data for Each Property.

Descriptives

price

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Average Sell out price	Average90 DBA price
					Lower Bound	Upper Bound				
bellagio	2366	302.61	87.100	1.791	299.10	306.13	149	675	367	277
caesars palace	2366	292.01	151.971	3.124	285.89	298.14	170	800	557	201
wynn	2366	293.68	79.170	1.628	290.49	296.87	159	699	432	332

Question 1 Analysis

The question 1 can be answered by hypothesis 1.

$H1_0$: There is no difference among average room rates of those three properties.

$H1_a$: There is difference among room average rates of those three properties.

Table3 shows that the null hypothesis can be rejected at the significant level of 0.05, which means the cheapest room prices from 3 hotels are different. The table 4 of Bonferroni Comparison Test result indicates Bellagio room price are different from both Caesars Palace and Wynn. It also shows that Caesars Palace and Wynn charge the same rate for the room type selected in this study.

Table 3

ANOVA

price	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	153837.582	2	76918.791	6.245	.002
Within Groups	8.739E7	7095	12316.539		
Total	8.754E7	7097			

Table 4

Multiple Comparisons

price

Bonferroni

(I) hotel	(J) hotel	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
bellagio	caesars palace	10.603*	3.227	.003	2.88	18.33
	wynn	8.936*	3.227	.017	1.21	16.66
caesars palace	bellagio	-10.603*	3.227	.003	-18.33	-2.88
	wynn	-1.667	3.227	1.000	-9.39	6.06
wynn	bellagio	-8.936*	3.227	.017	-16.66	-1.21
	caesars palace	1.667	3.227	1.000	-6.06	9.39

Multiple Comparisons

price

Bonferroni

(I) hotel	(J) hotel	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
bellagio	caesars palace	10.603*	3.227	.003	2.88	18.33
	wynn	8.936*	3.227	.017	1.21	16.66
caesars palace	bellagio	-10.603*	3.227	.003	-18.33	-2.88
	wynn	-1.667	3.227	1.000	-9.39	6.06
wynn	bellagio	-8.936*	3.227	.017	-16.66	-1.21
	caesars palace	1.667	3.227	1.000	-6.06	9.39

*. The mean difference is significant at the 0.05 level.

Question 2 Analysis

Question 2 can be answered by hypothesis 2.

$H2_{0:}$ The room rates are not different in those 3 main DBA periods for each property.

$H2_{a:}$ The room rates are different in those 3 main DBA periods for each property.

Bellagio

Table 5 indicates that the null hypothesis can be rejected at the significant level of 0.05. There are statistically significant differences among 3 main DBA periods for room price of Bellagio hotel. The table 6 of Bonferroni Comparison Test result further shows that Bellagio room price during every main DBA periods are different from each other.

Table 5

ANOVA

Bellagio					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3448694.662	2	1724347.331	281.140	.000
Within Groups	1.449E7	2363	6133.419		

ANOVA

Bellagio					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3448694.662	2	1724347.331	281.140	.000
Within Groups	1.449E7	2363	6133.419		
Total	1.794E7	2365			

Table 6

Multiple Comparisons

Bellagio

Bonferroni

(I) mainperiods	(J) mainperiods	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
0-30DBA	31-60DBA	74.502*	3.934	.000	65.08	83.93
	61-90DBA	85.506*	3.934	.000	76.08	94.93
31-60DBA	0-30DBA	-74.502*	3.934	.000	-83.93	-65.08
	61-90DBA	11.004*	3.966	.017	1.50	20.50
61-90DBA	0-30DBA	-85.506*	3.934	.000	-94.93	-76.08
	31-60DBA	-11.004*	3.966	.017	-20.50	-1.50

*. The mean difference is significant at the 0.05 level.

Caesars Palace

Table 7 indicates the null hypothesis can be rejected for Caesars Palace hotel at the significant level of 0.05. There are statistically significant differences among 3 main DBA periods for the price of Caesars Palace hotel. The table 8 shows the result of Bonferroni Comparison Test, which further shows that Caesars Palace room price during every main DBA periods are different from each other.

Table 7

ANOVA

caesarspalace					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.137E7	2	1.068E7	759.118	.000

Within Groups	3.325E7	2363	14072.884		
Total	5.462E7	2365			

Table 8

Multiple Comparisons

caesarspalace

Bonferroni

(I) mainperiods	(J) mainperiods	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
0-30DBA	31-60DBA	179.237*	5.958	.000	164.96	193.51
	61-90DBA	216.634*	5.958	.000	202.36	230.91
31-60DBA	0-30DBA	-179.237*	5.958	.000	-193.51	-164.96
	61-90DBA	37.397*	6.007	.000	23.01	51.79
61-90DBA	0-30DBA	-216.634*	5.958	.000	-230.91	-202.36
	31-60DBA	-37.397*	6.007	.000	-51.79	-23.01

*. The mean difference is significant at the 0.05 level.

Wynn

Table 9 indicates the null hypothesis can also be rejected for Wynn hotel at the significant level of 0.05. There are statistically significant differences among 3 main DBA periods for the room price of Wynn hotel. Table 10 of Bonferroni Comparison Test result further indicates there is statistically significant difference on Wynn hotel room prices between 0-30 and 31-60 main DBA periods and between 0-30 and 61-90 DBA periods. For the difference between 31-60 and 61-90 main DBA periods, Bonferroni comparison test shows the significant is 0.053, just little above the 0.05, which means only slight difference shown.

The table 11 shows one-way ANOVA test for the hotel price in the 31-60 and 61-90 main DBA periods at the significant level of 0.05, which indicates there is

statistically significant difference between the 31-60 and 61-90 main DBA periods for hotel price.

Table 9

ANOVA

wynn

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	466707.760	2	233353.880	89.605	.000
Within Groups	6153813.668	2363	2604.238		
Total	6620521.429	2365			

Table 10

Multiple Comparisons

wynn

Bonferroni

(I) mainperiods	(J) mainperiods	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
0-30DBA	31-60DBA	32.234*	2.563	.000	26.09	38.38
	61-90DBA	26.093*	2.563	.000	19.95	32.23
31-60DBA	0-30DBA	-32.234*	2.563	.000	-38.38	-26.09
	61-90DBA	-6.141	2.584	.053	-12.33	.05
61-90DBA	0-30DBA	-26.093*	2.563	.000	-32.23	-19.95
	31-60DBA	6.141	2.584	.053	-.05	12.33

*. The mean difference is significant at the 0.05 level.

Table 11

ANOVA

wynn

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	14707.756	1	14707.756	10.128	.001
Within Groups	2262612.179	1558	1452.254		
Total	2277319.936	1559			

Summary of question 2

The null hypotheses for question 2 for all hotels are rejected. Those results shows all hotels in this test are using dynamic pricing strategies for the same room type during different DBA periods, because we can explore the price difference among 3 main DBA periods in all hotel properties.

Question 3 Analysis

The room price trends during those 3 main DBA periods for each hotel are analysis as following.

Bellagio

Table 12 shows the room price mean during each main DBA period. The Variance1 in Table13 shows the variance of price change of Bellagio hotel by comparing the room price of its certain DBA period to the former main DBA period, and Variance2 shows the variance of the price change of Bellagio hotel by comparing the price of its certain DBA period to the average price of 90 DBA. Figure 2 shows the price trends during those 3 main periods. The price increases within 61-90 DBA period, keeps increasing from the 61-90 DBA period to the 31-60 DBA period, and boosts significantly from the 31-60 DBA period to 0-30 DBA period.

Table 12

Descriptives

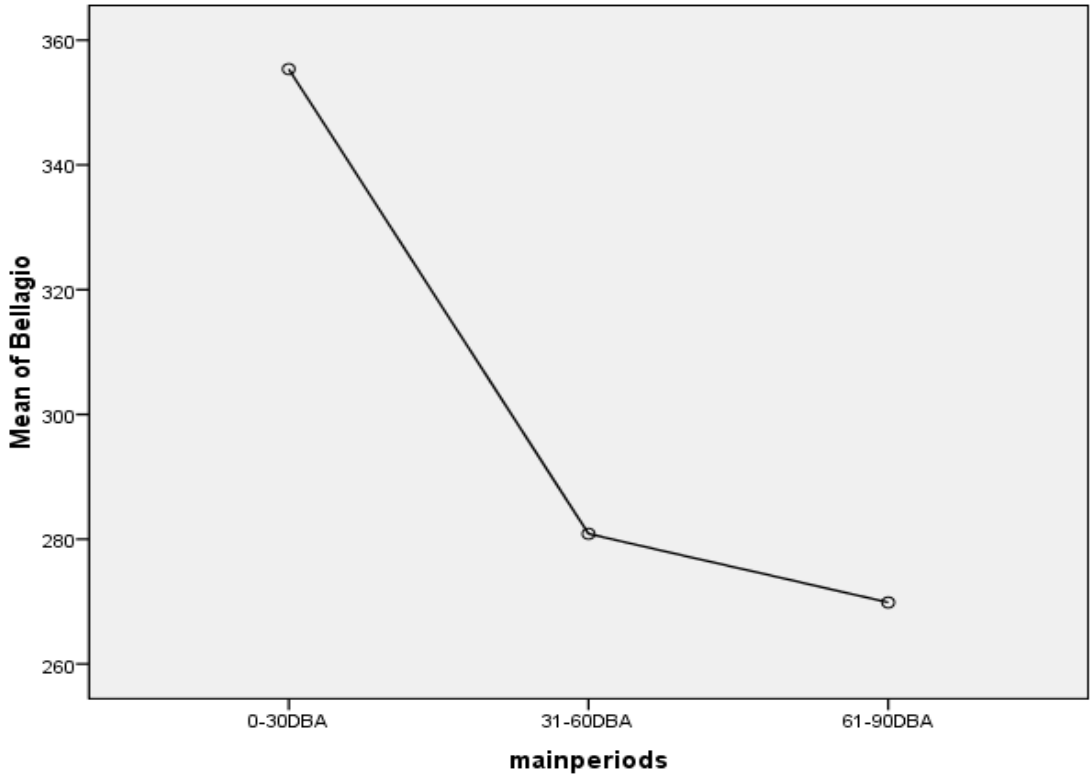
Bellagio								
					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
0-30DBA	806	355.36	97.865	3.447	348.60	362.13	179	675
31-60DBA	780	280.86	63.604	2.277	276.39	285.33	149	459

61-90DBA	780	269.86	68.281	2.445	265.06	274.66	179	399
Total	2366	302.61	87.100	1.791	299.10	306.13	149	675

Table 13

DBA periods	Average price	Variance1	Variance2
90 day	269.859	N/A	N/A
0-30 days	355.36	26.53%	76.32%
31-60 days	280.86	4.08%	39.36%
61-90 days	269.86	N/A	33.90%

Figure 2



Caesars Palace

Table 14 shows room price mean of Caesars Palace hotel during each main DBA period. Variance1 in Table 15 shows the variance of price change of Caesars Palace by comparing the price of the certain DBA period to the former main DBA period, and Variance2 of Table 15 shows the variance of the price change by

comparing the price of the certain DBA period to the average price of 90 day DBA. Figure 3 shows the price trends during those three main periods.

The price decreases during 61-90 DBA period. The price increased 18.16% from 61-90 DBA periods to 31-60 DBA period. However, the price of 31-60 DBA period is only 4% more than the price of 90 DBA after the increase. Table 15 shows the substantial increase (73.62%) of price comparing the price of the 31-60 DBA period to the price of 0-30 DBA period.

Table 14

Descriptives

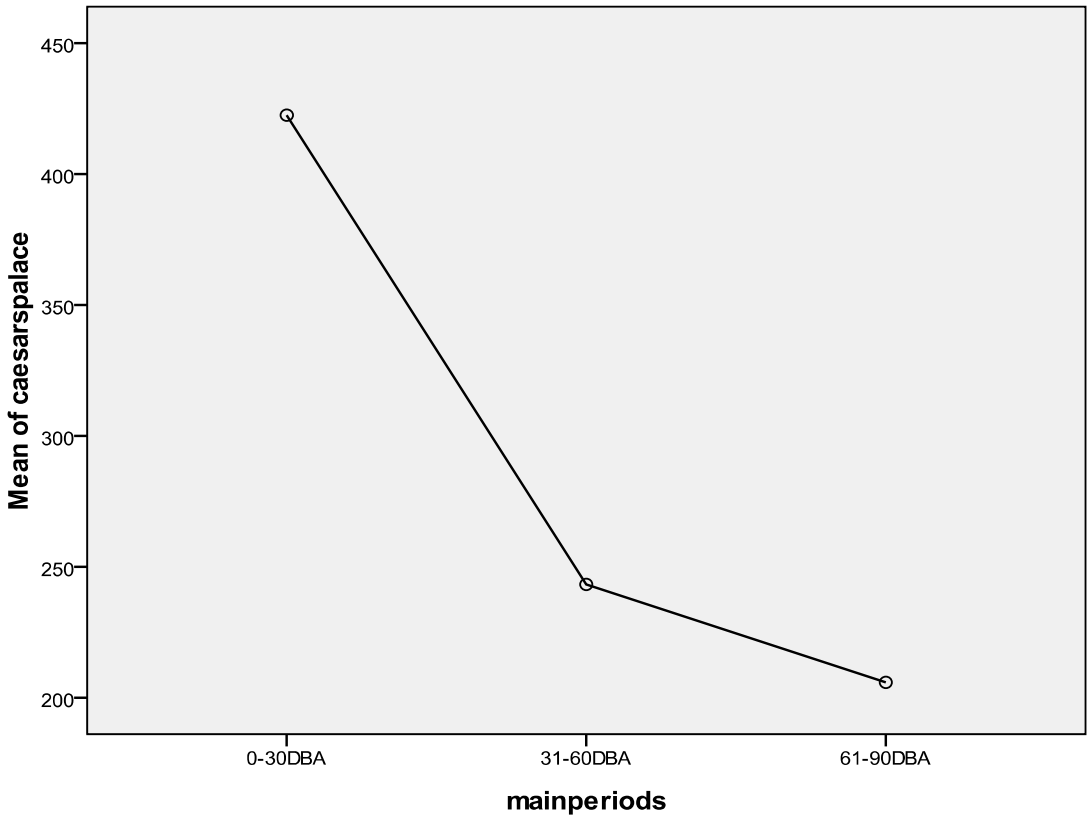
caesarspalace

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0-30DBA	806	422.52	185.197	6.523	409.71	435.32	190	800
31-60DBA	780	243.28	79.926	2.862	237.66	248.90	170	700
61-90DBA	780	205.88	29.281	1.048	203.83	207.94	170	300
Total	2366	292.01	151.971	3.124	285.89	298.14	170	800

Table 15

DBA periods	Average price	Variance2	Variance2
90 day	201.54	N/A	N/A
0-30 days	422.52	73.62%	81.76%
31-60 days	243.28	18.16%	4.65%
61-90 days	205.88	N/A	-11.43%

Figure 3



Wynn

Table 16 shows the mean of the price of Wynn hotel during each main DBA periods. Variance1 of Table 17 shows the variance of price change of Wynn hotel by comparing the price of its certain DBA period to the former main DBA period, and Variance2 of Table 17 shows the variance of the price change of Wynn hotel by comparing the price of its certain DBA period to the average price of 90 DBA. Figure 4 shows the price trends during those three main periods.

During 61-90 DBA periods, the price decreases. The price still decreased from 61-90 DBA periods to 31-60 DBA periods. The price of 0-30 DBA period increased 14% compared to that of 31-60 DBA period. However, the price is also 20% below when compared with price of 90 DBA.

Table 16

Descriptives

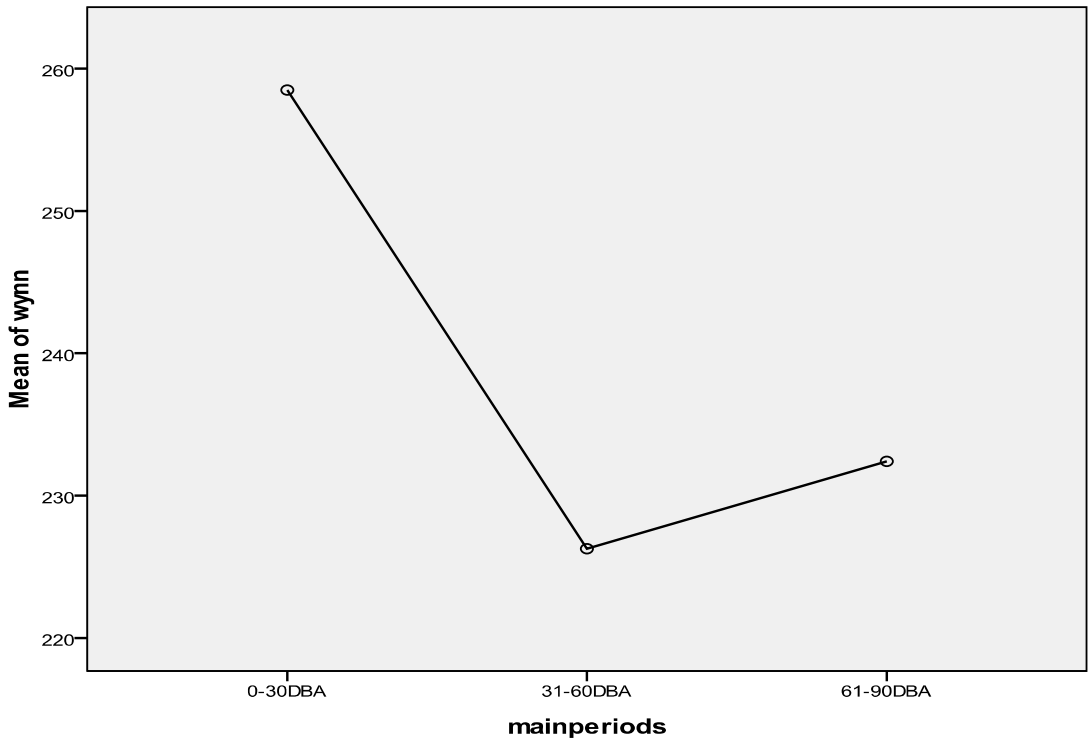
wynn

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0-30DBA	806	258.50	69.525	2.449	253.70	263.31	149	699
31-60DBA	780	226.27	35.416	1.268	223.78	228.76	149	329
61-90DBA	780	232.41	40.623	1.455	229.55	235.27	149	349
Total	2366	239.27	52.909	1.088	237.14	241.41	149	699

Table 17

DBA periods	Average price	Variance2	Variance2
90 day	323.62	N/A	N/A
0-30 days	258.50	14%	-20.12%
31-60 days	226.27	-3%	-30.08%
61-90 days	232.41	N/A	-28.18%

Figure 4



Summary of question 3

The analysis of three hotels shows different price trends. For the price trends of Bellagio hotel and Caesars Palace hotel, they share similar pattern among those

three main DBA period. The price increases as the DBA decreases. However, there are also minor differences between Bellagio hotel and Caesars Palace hotel. The price of Caesars Palace hotel during the 61- 90 DBA period decreases, while the price of Bellagio hotel increases within all DBA period. The increase of Caesars Palace hotel from 31-60 DBA to 0-30 DBA period is huge, which is far bigger than its other DBA periods. The variance of the increase compared with 90 DBA is the biggest within all hotels. The price trend of Wynn hotel is different from others. The price decreases from the 90 DBA to the 31-60 DBA period. Although it shows the increment from 31-60 DBA period to 0-30 DBA period, the average price is also lower than the price of 90 DBA.

Question 4 Analysis

Question 4 can be answered by hypothesis 3. One-way ANOVA test was conducted for price difference of minor DBA periods during each main DBA period of each hotel at a 0.05 significant level.

Bellagio

Table 18 shows the result of ANOVA test for price difference of Bellagio Hotel during 0-10,11-20, and 21-30 minor DBA periods. The Null hypothesis was rejected for those periods. Table 19 shows the result of Bonferroni Comparison Test. The test result indicates that the price difference between 0-10 and 11-20 DBA periods is not significant and the difference appears between 11-20 and 21-30 DBA period.

The Table 20 and Table 21 show the result of ANOVA test for price difference of minor DBA period during 31-60 and 61-90 DBA periods. The Null hypothesis

was accepted for those periods, so the price difference is not significant between 31-60 DBA period and 61-90 DBA periods for Bellagio hotel.

Table 18

ANOVA

Bellagio1

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	247551.801	2	123775.901	13.319	.000
Within Groups	7462376.958	803	9293.122		
Total	7709928.759	805			

Table 19

Multiple Comparisons

Bellagio1

Bonferroni

(I) p1	(J) p1	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
0-10	11-20	11.3497	8.2605	.510	-8.467	31.167
	21-30	41.5420*	8.2605	.000	21.725	61.359
11-20	0-10	-11.3497	8.2605	.510	-31.167	8.467
	21-30	30.1923*	8.4549	.001	9.909	50.476
21-30	0-10	-41.5420*	8.2605	.000	-61.359	-21.725
	11-20	-30.1923*	8.4549	.001	-50.476	-9.909

*. The mean difference is significant at the 0.05 level.

Table 20

ANOVA

Bellagio2

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	16022.636	2	8011.318	1.823	.162
Within Groups	3529461.247	803	4395.344		
Total	3545483.882	805			

Table 21

ANOVA

Bellagio3

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	14160.274	2	7080.137	1.521	.219
Within Groups	3617764.213	777	4656.067		
Total	3631924.487	779			

Caesars Palace

Table 22 shows the result of ANOVA test for price difference of Caesars Palace Hotel during 0-10, 11-20, and 21-30 minor DBA periods. The Null hypothesis was rejected for those periods. Table 23 shows the result of Bonferroni Comparison Test. The test results indicated that the price difference is significant among all minor DBA period during 0-31 DBA periods.

The Table 24 and Table 25 show the result of ANOVA test for price difference during minor DBA periods from 31-60 to 61-90 DBA periods. The Null hypothesis was accepted for those periods, which means the price difference is not significant within 31-60 DBA period and 61-90 DBA periods for Caesars Palace hotel.

Table 22

ANOVA

Caesarspalace1

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4113817.815	2	2056908.908	70.297	.000
Within Groups	2.350E7	803	29260.423		
Total	2.761E7	805			

Table 23

Multiple Comparisons

Caesarspalace1

Bonferroni

(I) p1	(J) p1	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound

0-10	11-20	101.6399*	14.6577	.000	66.476	136.804
	21-30	172.3706*	14.6577	.000	137.207	207.535
11-20	0-10	-101.6399*	14.6577	.000	-136.804	-66.476
	21-30	70.7308*	15.0027	.000	34.739	106.722
21-30	0-10	-172.3706*	14.6577	.000	-207.535	-137.207
	11-20	-70.7308*	15.0027	.000	-106.722	-34.739

*. The mean difference is significant at the 0.05 level.

Table 24

ANOVA

Caesarspalace2

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	31792.108	2	15896.054	2.018	.134
Within Groups	6324435.219	803	7876.009		
Total	6356227.326	805			

Table 25

ANOVA

Caesarspalace3

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2526.221	2	1263.111	1.475	.229
Within Groups	665363.394	777	856.324		
Total	667889.615	779			

Wynn

Table 26 shows the result of ANOVA test for price difference of Wynn Hotel during 0-10, 11-20, and 21-30 minor DBA periods. The Null hypothesis was rejected for those periods. Table 27 shows the result of Bonferroni Comparison Test for the price change of minor periods within 0-30 DBA periods. The test result indicates that the price difference is significant among all minor DBA period during 0-31 DBA periods.

Table 28 shows the result of ANOVA test for price difference of Wynn Hotel during 31-40, 41-50, and 51-60 minor DBA periods. The Null hypothesis was also rejected. Table 29 shows the result of Bonferroni Comparison Test of the price change of minor periods within 31-60 DBA periods. Table 30 shows the ANOVA test result of significant price difference is also among all minor periods within 61-90 periods. The null hypothesis is accepted, which indicates there is no significant difference within 61-90 periods.

Table 26

ANOVA

Wynn1

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1846518.681	2	923259.341	112.687	.000
Within Groups	6579055.140	803	8193.095		
Total	8425573.821	805			

Table 27

Multiple Comparisons

Wynn1

Bonferroni

					95% Confidence Interval	
(I) p1	(J) p1	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
0-10	11-20	80.3916*	7.7562	.000	61.784	98.999
	21-30	112.3531*	7.7562	.000	93.746	130.960
11-20	0-10	-80.3916*	7.7562	.000	-98.999	-61.784
	21-30	31.9615*	7.9388	.000	12.916	51.007
21-30	0-10	-112.3531*	7.7562	.000	-130.960	-93.746
	11-20	-31.9615*	7.9388	.000	-51.007	-12.916

*. The mean difference is significant at the 0.05 level.

Table 28

ANOVA

wynn2

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	44970.731	2	22485.365	6.323	.002
Within Groups	2855621.329	803	3556.191		
Total	2900592.060	805			

Table 29

Multiple Comparisons

wynn2

Bonferroni

(I) p2	(J) p2	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
31-40	41-50	17.6399*	5.1100	.002	5.381	29.899
	51-60	4.5629	5.1100	1.000	-7.696	16.822
41-50	31-40	-17.6399*	5.1100	.002	-29.899	-5.381
	51-60	-13.0769*	5.2302	.038	-25.624	-.530
51-60	31-40	-4.5629	5.1100	1.000	-16.822	7.696
	41-50	13.0769*	5.2302	.038	.530	25.624

*. The mean difference is significant at the 0.05 level.

Table 30

ANOVA

Wynn3

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9103.971	2	4551.985	1.073	.343
Within Groups	3297496.029	777	4243.882		
Total	3306600.000	779			

Summary of question 4

The analysis of Bellagio and Caesars Palace shows similar result. There are significant price difference within 0-30 DBA period and no significant price difference within 31-60 and 61-90 DBA periods. However, there are also some differences between Bellagio and Caesars Palace hotels within 0-30 DBA period.

The result of Wynn is different from other hotels. The significant price difference was not only shown within 0-30 DBA period, but also showed within 31-60 DBA periods.

Question 5 Analysis

The hotel price trends of minor DBA period for each hotel are analyzed as following.

Bellagio

Only price trends of minor DBA period with 0-30 DBA period is analyzed, because there is no significant price difference within 31-60 and 61-90 DBA periods.

Table 31 shows the description of the Bellagio room price of minor DBA periods within 0-30 DBA period. Variance1 in the table 32 indicates the price difference between two adjacent minor DBA periods. The Variance 2 indicates the difference of price in current DBA period and average price of 30 DBA. An increment can be found from 21-30 to 10-20 DBA periods. Figure 4 shows the price trend within 0-30 DBA period.

Table 31

Descriptives

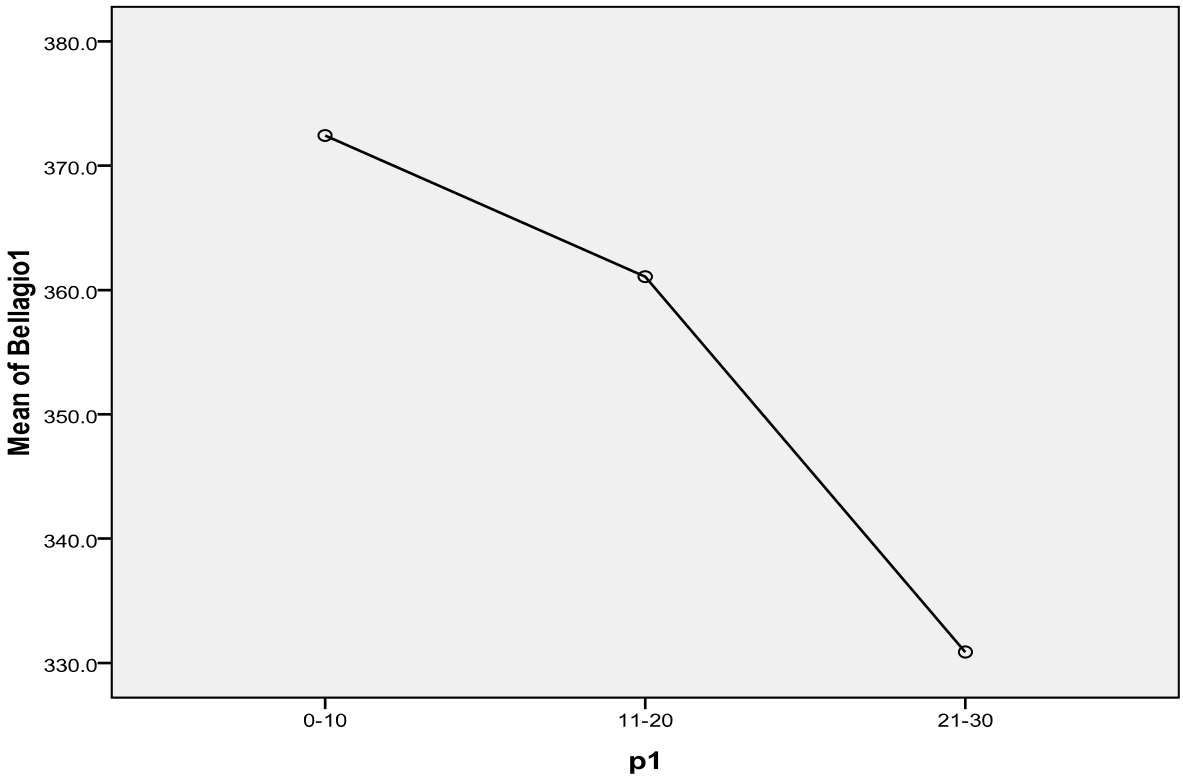
Bellagio1

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0-10	286	372.427	95.3833	5.6401	361.325	383.528	199.0	675.0
11-20	260	361.077	97.7879	6.0645	349.135	373.019	179.0	499.0
21-30	260	330.885	96.1172	5.9609	319.147	342.623	179.0	499.0
Total	806	355.365	97.8650	3.4471	348.598	362.131	179.0	675.0

Table 32

DBA periods	Average price	Variance1	Variance2
30 day	309.77	N/A	N/A
0-10 days	372.427	3.14%	20.23%
11-20 days	361.077	9.12%	16.56%
21-30 days	330.885	N/A	6.82%

Figure 4



Caesars Palace

Only price trends of minor DBA period within 0-30 DBA period is analyzed for Caesars Palace, because there is no significant price difference with 31-60 and 61-90 DBA periods.

Table 33 shows the description of the Caesars Palace room price of minor DBA periods within the 0-30 DBA period. Variance1 in the table 34 indicates the price

difference between two adjacent minor DBA periods. The Variance 2 indicates the difference of price in current DBA period and average price of 30 DBA. Continuous increment can be found within 0-30 DBA periods. The price difference between the 0-10 DBA period and 11-12 DBA periods is remarkable and the biggest for adjacent minor DBA period among all hotels. Figure 5 shows the price trend within 0-30 DBA period.

Table 33

Descriptives

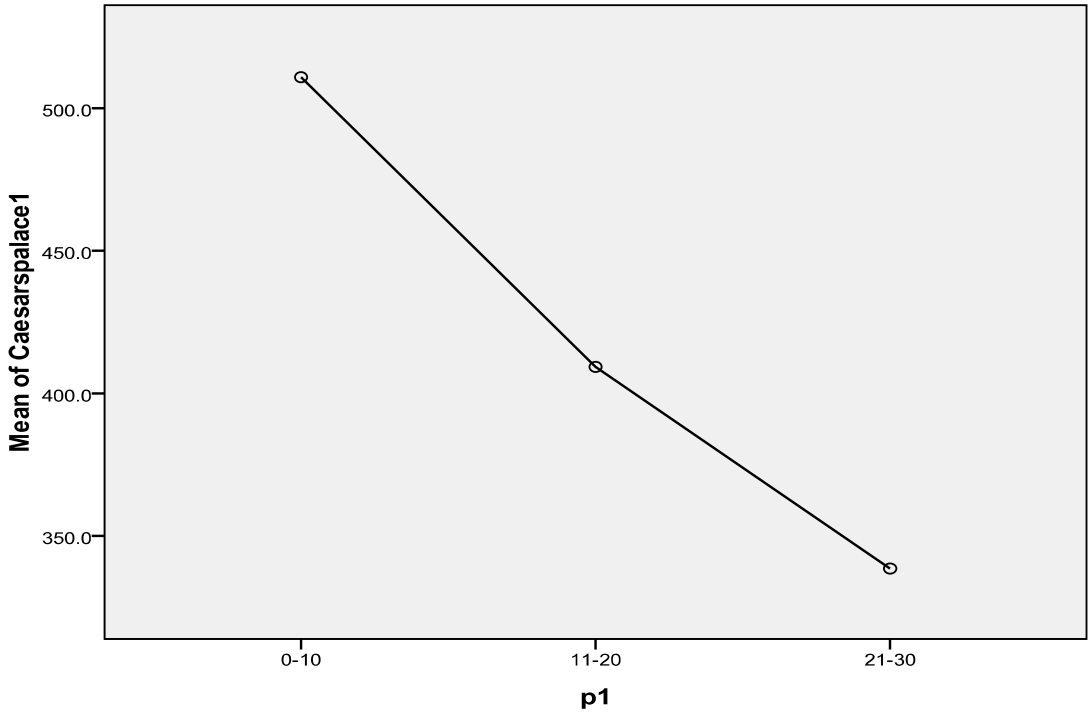
Caesarspalace1

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0-10	286	510.909	177.3065	10.4844	490.273	531.546	225.0	800.0
11-20	260	409.269	178.8802	11.0937	387.424	431.115	200.0	800.0
21-30	260	338.538	155.3287	9.6331	319.569	357.508	190.0	800.0
Total	806	422.519	185.1974	6.5233	409.714	435.323	190.0	800.0

Table 34

DBA periods	Average price	Variance1	Variance2
30 day	308.0769	N/A	N/A
0-10 days	510.909	24.83%	65.84%
11-20 days	409.269	20.89%	32.85%
21-30 days	338.538	N/A	9.89%

Figure 5



Wynn

The price trends of minor DBA period within both 0-30 and 31-60 DBA periods were analysis for Wynn hotel, because there are significant price differences within those periods.

Table 35 and Table 37 describes Wynn room price of minor DBA periods within the 0-30 and 31-60 DBA periods. Variance1 in table 36 and table 38 indicates the price difference between two adjacent minor DBA periods. The Variance 2 in table 36 indicates the difference of price in current DBA period and average price of 30 DBA, and the Variance 2 in table 38 indicated the difference of price in current DBA period and average price of 60 DBA. Continuous increment can be found within 0-30 DBA periods. The price decreases from the 51-60 DBA periods to the 40-51 DBA period and increases from the 40-51 DBA periods to the 31-40 DBA period.

Figure 6 shows the price trend within 0-30 DBA period and Figure 7 illustrates the price trend within 31-60 DBA period.

Table 35

Descriptives

Wynn1

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0-10	286	368.161	123.4049	7.2971	353.798	382.524	199.0	699.0
11-20	260	287.769	77.8278	4.8267	278.265	297.274	169.0	599.0
21-30	260	255.808	50.8632	3.1544	249.596	262.019	159.0	359.0
Total	806	305.985	102.3062	3.6036	298.912	313.059	159.0	699.0

Table 36

DBA periods	Average price	Variance1	Variance2
The 30 day	247.08	N/A	N/A
0-10 days	368.161	27.94%	49.01%
11-20 days	287.769	12.49%	16.47%
21-30 days	255.808	N/A	3.53%

Table 37

Descriptives

wynn2

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
31-40	286	276.063	68.3524	4.0418	268.107	284.018	169.0	699.0
41-50	260	258.423	50.5267	3.1335	252.253	264.594	159.0	399.0
51-60	260	271.500	57.7197	3.5796	264.451	278.549	189.0	399.0
Total	806	268.901	60.0268	2.1144	264.750	273.051	159.0	699.0

Table 38

DBA periods	Average price	Variance1	Variance2
The 60 day	292.8462	N/A	N/A
31-40 days	276.063	6.83%	11.73%
41-50 days	258.423	-4.82%	4.59%
51-60 days	271.5	N/A	9.88%

Figure 6

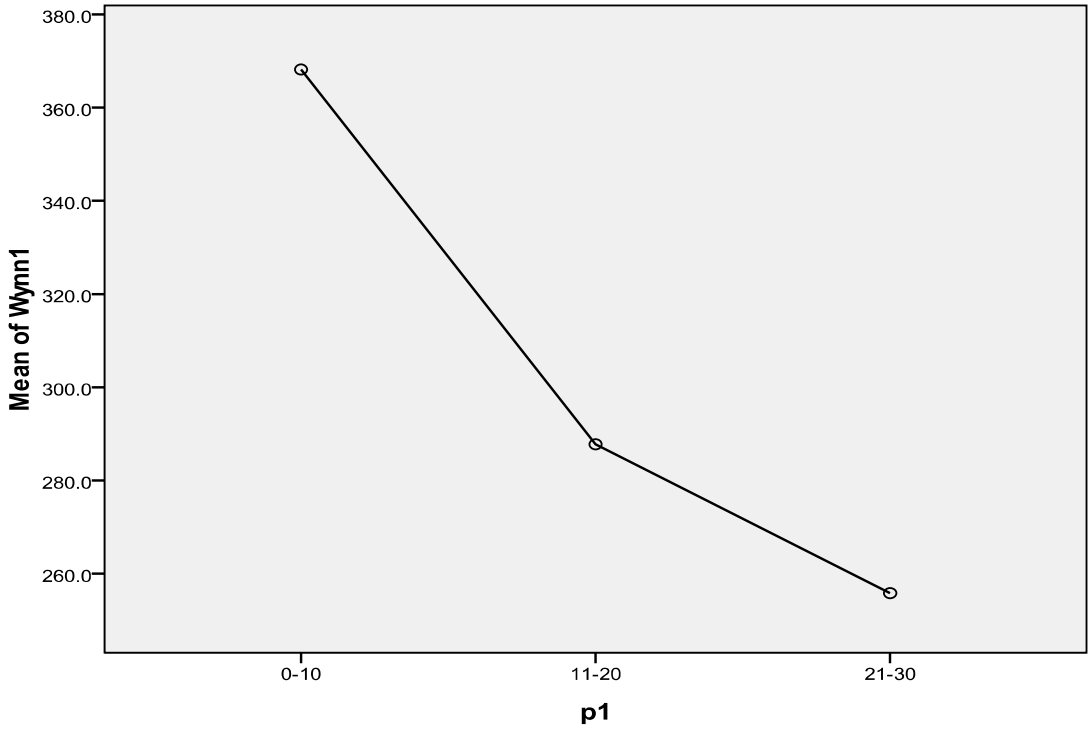


Figure 7

Summery of Question 5

The analysis of three hotels shows the different price trends. For the price trends of Bellagio hotel and Caesars Palace hotel, similar price trends among minor DBA period are shown. The price increases while the DBA decreases. The price diffidence is significant within 0-30 DBA periods and is not significant within 31-60 and 61-90 DBA periods. However, there are also minor differences existing

between Bellagio and Caesars Palace. The price change of Bellagio hotel from 0-10 and 11-20 periods is not significant.

The increase of Caesars Palace hotel from 11-20 to 0-10 DBA period is substantial, which is far bigger than its other minor DBA periods. It is the biggest change for all adjacent minor DBA period among all hotels.

. The minor DBA period price trend of Wynn hotel is different from others. Significant price difference is found within both 0-30 and 31-60 DBA periods. The minor period price trend within 0-30 DBA period is similar to other two hotels. The price increases consistently, as DBA gets closer to DOA. The price decreases from 51-60 to 41-50 DBA periods, and increases from 41-50 to 31-40 DBA period.

Result and conclusion

As Figure 8 showed, Caesars Palace set up its room rate at $201 in the beginning stage, continuously increased it little by little to $308 on the 30 DBA, and increased it aggressively at a price of $557 finally. Bellagio room rate started at $277, increase it steadily to $309 on the 30DBA, and increased sharply to rate $377 in another 10 days. The final rate for Bellagio was 362. Wynn's 90 DBA room rate was $323. Wynn decreases it to 247 on 39 DBA and increases it until the last day at a price of 432.

Bellagio and Caesars Palace's price strategy are similar they offer low room rate on the time far from customer DOA and gradually increased the room rate until 30 days before DBA. They both increased the room rate significantly during 30 days before DBA. The increase of Caesars Palace hotel from 11-20 to 0-10 DBA period

is substantial, which is far bigger than its other minor DBA periods. It is the biggest change for all adjacent minor DBA period among all hotels.

Wynn uses the different strategy from others, it offers a room rate which closed to the sellout rate, then decrease it gradually until 40-50 days before DBA. The room rate increased after 40days before DBA and approach to a price 50% higher than the 90 days average.

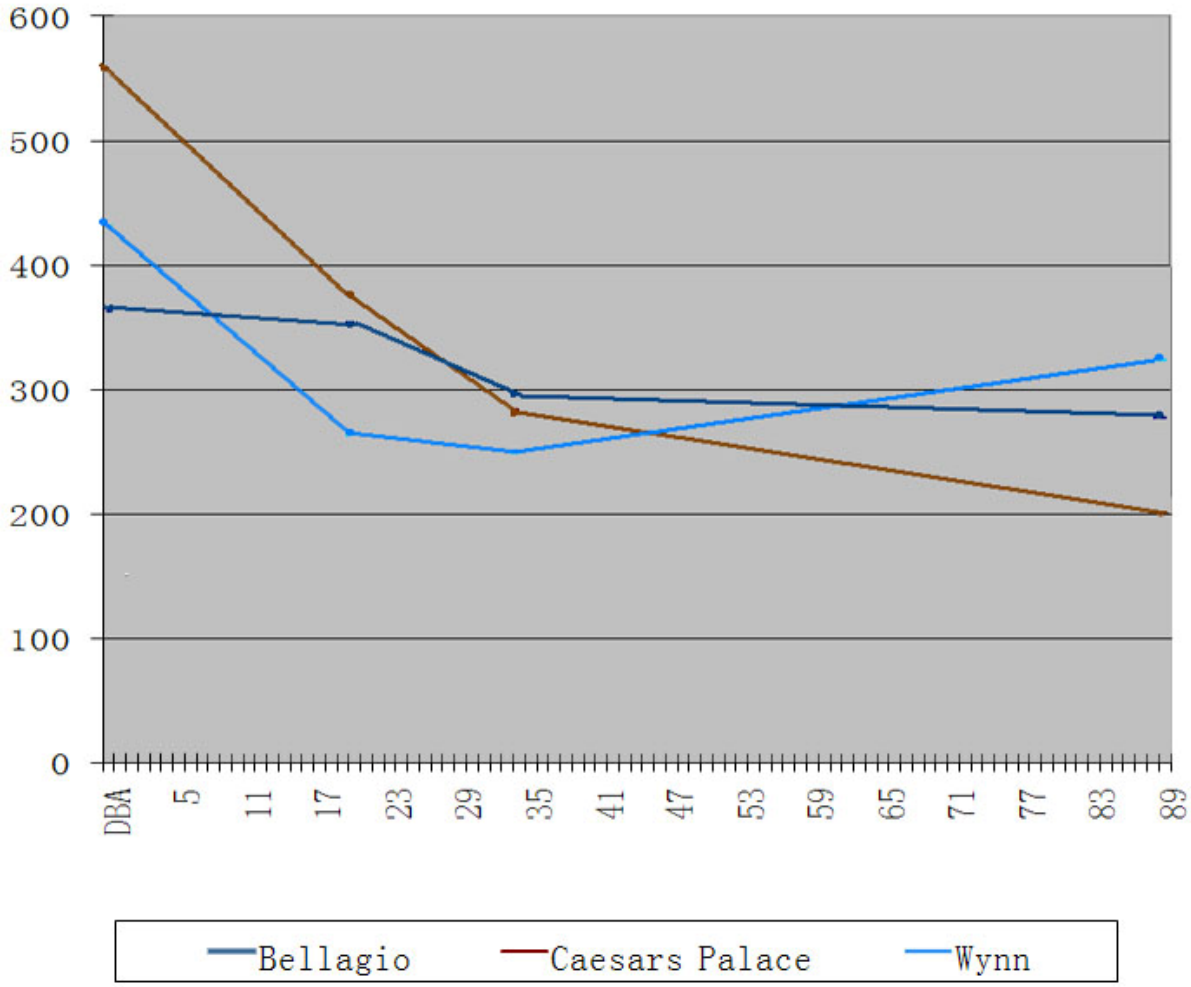


Figure 8

All three hotels considered fairness practices in establishing their room rates. Bellagio's and Caesar's Palace's price strategy offers cheap prices to customers who book earlier. The room rate of Wynn and Bellagio may be considered to be set in

consideration of customer sensitivity, as the hotel did not increase the price too aggressively. However, the result also indicates that hotels' discriminatory pricing strategies demonstrated some defects in fairness practices. Caesar's Palace's price strategy increased the price too much during the 30 DBA, which may cause customers to consider the price to be too expensive, and even customers who book a room may think the service doesn't approach the desired level for the money paid. When customers who book earlier in Wynn find out that another customer who booked later than they did got a cheaper price, they may also feel that the transaction was unfair. The Bellagio may practice the best pricing among those three hotels because it did not change the price too aggressively and offered a discount only to the customers who booked far in advance of DBA.

Recommendations for Future Research

The price research presented here can be developed further. Researchers can analysis more hotel and more room type to find out what price pattern were used by hotels now, and they may also separate DBA period more sophisticate to find out the delicate price change. If researchers can access the occupation details, they may explore which strategy could optimize revenue more efficient. The researchers can also give survey to customer find out what is the price sensitivity for FIT customer segments of luxury hotel to find out how hotel should setting the upper and lower limit for their dynamic price. Since leisure customer may want to book earlier and business customer may prefer book near DOA. The proportion of those two customer segments may different as the date of arrival draws closer and the

customer price sensitivity may also change. If the research can find out how sensitivity change according to different DBA, it would make hotel set up price more easier.

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