A Study on Dynamic Pricing of Hotels on Consumers' Purchase Intention Based on Prospect Theory and Regret Theory

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Abstract. In the context of intense hotel competition and complex consumer behavior, the traditional static pricing model has been difficult to provide a more efficient solution for hotel pricing. In this paper, by combining prospect theory and regret theory, the dynamic pricing strategy of hotels is studied in terms of consumers' psychology, and consumer behavior. Through the survey and analysis, older consumers are more sensitive to gains and losses than younger consumers and are also more likely to experience regret. Occupation also has an impact on consumers' willingness to buy, with civil servants and entrepreneurs being more sensitive to gains and losses compared to other occupations. Differences in income levels are also an important factor influencing consumers. The analysis shows that the high-income group exhibits a stronger focus on dynamic price changes compared to the low-income group, a difference that also suggests variability in consumption habits due to different incomes.

1 Introduction

In recent years, the tourism and leisure industry has been developing rapidly. The hotel industry, as one of the most competitive industries, the choice of marketing strategy is crucial [1]. Driven by revenue maximization, more frequent dynamic price adjustments by hoteliers through e-commerce platforms have become a mainstream way of implementing dynamic pricing strategies [2]. This has likewise led to increased information transparency and a significant increase in consumers' price sensitivity, and their purchase decisions are not only influenced by price, but also dependent on psychological changes [3]. In this paper, we will combine the regret theory and prospect theory to study the impact of hotel dynamic pricing on consumer behavior in terms of psychological, behavioral and other elements, and try to provide some suggestions for hotels to improve their revenue management ability, optimize consumer experience through dynamic pricing, and enhance brand loyalty.

2 Literature review

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2.1 Prospect Theory

Prospect Theory, first proposed by psychologists Daniel Kahneman and Amos Tversky in 1979, reveals a systematic cognitive bias in real decision-making [4]. The core of prospect theory states that people tend to measure gains and losses based on their own psychological reference points (historical prices, expectations) rather than absolute values, and that the pain of a loss is much greater than the pleasure of a gain, and that when faced with a probabilistic event, people will overestimate the small probability event and underestimate the medium to high probability event. The theory was initially used in the field of behavioral economics and decision psychology, such as financial investment, marketing, risk management. In the area of dynamic hotel pricing, Han, W's research found that when a hotel offers discounts or complimentary gifts, it gives consumers the feeling that they have earned it, which will increase the probability that they will choose that hotel, even if there are low ratings [5]. Smith, S. J.'s research found that hotel price increases and the use of discounts have a direct impact on consumers' willingness to buy because it is directly related to the consumer's gains and losses [6]. Román, C.'s study found that consumers create an asymmetry when valuing losses and gains, and that different consumers have different perceptions of losses and gains [7].

2.2 Regret Theory

The regret theory was first proposed by economists Graham Loomes and Robert Sugden in 1982 and later deepened by scholars such as David E. Bell [8]. The theory breaks away from the traditional rational decision-making model by emphasizing that "regret triggered by the contrast between the decision outcome and the unselected option" affects future choices in a reverse way, and that the core mechanisms include pre-decision concerns about choosing the wrong option, post-decision pain at discovering that there is a better solution, and the premium that people are willing to pay to mitigate the risk of regret. Lee, S's study found that the majority of dissatisfied reviews in online booking platforms come from consumers' regret about price and service perceptions, and that regret is an important factor influencing consumers' willingness to buy [9]. Nong's study found that situations with room rate discrepancies lead to consumer regret, which affects their intention to stay at that hotel again [10]. Tzeng, S. Y's study concluded that marketers should use more precise marketing techniques for different consumers to prevent customers from regretting overlooked alternatives, as this will affect consumers' willingness to buy in the future [11].

2.3 Models and assumptions

This paper establishes a model that dynamic pricing of hotels generates prospect theory effect and regret theory effect and then affects the purchase intention from the perspective of consumer psychology, and at the same time, psychological perception and price tolerance are added to the model, psychological perception occurs in the stage of evaluating the quality of the product after consumers view the price of dynamic pricing, and then in the process of purchasing, the consumers will be affected by the prospect theory effect and the regret theory effect, and finally consumers will produce a price tolerance, which is the behavior of still deciding to make a purchase, according to their own situation. Based on the above viewpoints, this paper assumes that consumers' purchase intention receives direct influence from psychological perception, prospect theory effect, regret theory effect, and price tolerance.

2.3.1 Psychological perception

When a consumer sees the pricing of a hotel, a mental assessment of that price is created, resulting in an anchored price, which is often based on the historical price of a hotel room or their own previous purchasing experience. This anchored price is an important basis for determining whether the consumer is willing to accept the instant price.

2.3.2 Prospect theory effect

Prospect theory effect means that after knowing the pricing, consumers will think about which point in time they can maximize the revenue by making a purchase now and in the future, for example, if it is now during the promotion of an event, then in the future there will be a tendency for the price to increase, and in order to make a revenue for themselves, consumers may make the decision to make a purchase right away.

2.3.3 Regret theory effect

Regret theory effect means that during the period of decision making whether to buy or not, consumers will be obsessed with whether there is a better choice or not, and when the purchase behavior is completed, if consumers find that there is a better solution, they will have regret, this phenomenon also arises in the period of purchasing, which creates worries for consumers, thus affecting the willingness to buy.

2.3.4 Price tolerance

Tolerance refers to the tolerance interval resulting from the fact that consumers are still willing to purchase goods after experiencing the prospect theory effect and the regret theory effect. For example, some consumers who pay more attention to the overall experience of consumption or are willing to pay for high-quality services will have a higher tolerance, while those who are obsessed with the benefits will have a lower tolerance.

3 Research method

3.1 Analytical methods and data collection

The survey was conducted using a questionnaire, which covered a number of dimensions such as the psychological perception of price and regret that consumers have in the process of making hotel orders. To ensure the rigor and scientificity of the study, a series of statistical analysis methods were used, including reliability analysis to test the stability of the questionnaire measurements, structural validity analysis to evaluate the fit between the scale structure and the theoretical assumptions, descriptive statistical analysis to characterize the basic features of the data presented, independent samples t-test and ANOVA to explore the differences between different groups, and linear regression analysis to explore the intrinsic relationship between variables. It was planned to collect about 120 questionnaires for data analysis and processing using the Questionnaire Star mini-program.

3.2 Questionnaire design and variable description

The questionnaire is divided into two parts, the first part is designed 12 questions from four aspects of consumer psychological perception, prospect theory effect, regret theory effect,

price tolerance, and the interview is conducted in the form of Likert scale, and the options are in the order of Strongly Agree (5)-Strongly Disagree (1) from top to bottom. The second part is the respondents' private information including gender, age, income, city of residence, and occupation.

4 Data analysis

4.1 Descriptive statistical analysis

The questionnaire research collected data from a total of 121 participants. Among them, in terms of age distribution, the age group of 25-34 years old accounted for the highest proportion of 34.70%, followed by the age group of 35-44 years old with a proportion of 25.60%. The age group of 18-24 years old accounted for 21.50%, the age groups of 45-60 years old and under 18 years old accounted for relatively small proportions of 7.40% and 8.30% respectively, and the age group of 60 years old and above accounted for the lowest proportion of only 2.50%. In terms of gender, males accounted for 57.00% and females 43.00%. In terms of the distribution of the highest educational level, undergraduate degree accounted for the highest proportion of 47.10%, high school and below accounted for 38.00%, and postgraduate degree and above accounted for 14.90%. In terms of occupation type, school students accounted for 29.80%, corporate employees/company white-collar workers accounted for 31.40%, freelancers accounted for 17.40%, civil servants/institution personnel accounted for 7.40%, and self-employed/entrepreneurs accounted for 14.00%. In terms of income level, RMB 3,000 and below accounted for 38.00%, RMB 3,001-6,000 accounted for 35.50%, RMB 6,001-10,000 accounted for 15.70%, RMB 1,001-15,000 accounted for 5.00%, and RMB 15,001 and above accounted for 5.80%. In terms of travel behavior, the proportion of those who traveled six times or more in a year was the highest, at 34.70%, 3-5 times accounted for 31.40%, 1-2 times accounted for 24.00%, and less than one time accounted for 9.90%.

4.2 Reliability analysis

In order to test the reliability of the scales of this study (table 1), the reliability of the four variables, psychological perception, prospect theory perception, regret theory perception and price tolerance perception, was tested in this study using SPSS 26. The results showed that the Cronbach's Alpha value of 0.822 for psychological perception, 0.822 for prospect theory perception, 0.863 for regret theory perception, and 0.828 for price tolerance perception all indicate that the scales for each variable have high internal consistency and can reliably measure the corresponding perceptual variables. When all 12 measures were combined, the total Cronbach Alpha value was 0.953, further indicating that the internal consistency of the entire scale was very high, ensuring the credibility of the study results.

Table 1. Reliability statistics

dimension	Alpha	Number of items	Total
psychological perception	0.822	3	0.953
prospect theory effect	0.822	3	
regret theory effect	0.863	3	
Price tolerance	0.828	3	

4.3 Correlation analysis

In the correlation analysis (table 2), age is closely related to individuals' price tolerance perception, psychological perception, prospect theory perception, and regret theory perception, as evidenced by the fact that older individuals tend to score higher in these perceptions. Occupation type is closely related to individuals' price tolerance perceptions, psychological perceptions, prospect theory perceptions and regret theory perceptions, as evidenced by the fact that entrepreneurs and civil servants tend to score higher in the above perceptions. In addition, monthly income was strongly associated with individuals' price tolerance perceptions, psychological perceptions, prospect theory perceptions, and regret theory perceptions, specifically the higher the monthly income the higher the perceptions scores. Finally, the number of trips was significantly and positively related to regret theory perceptions, indicating that the more trips taken, the higher the regret theory perceptions tended to be.

Table 2. Correlation analysis

	age	gender	Highest academic qualifications	Type of occupation	Monthly income level	Number of trips possible in a year	psychological perception	prospect theory effect	regret theory effect
age									
gender	0.017								
Highest academic qualifications	-0.014	0.053							
Type of occupation	0.685**	-0.026	0.013						
Monthly income level	0.303**	0.139	0.234**	0.155					
Number of trips possible in a year	0.046	-0.126	-0.245**	0.169	-0.016				
psychological perception	0.564**	0.071	0.064	0.613**	0.313**	0.132			
prospect theory effect	0.651**	-0.01	0.019	0.623**	0.341**	0.072	0.637**		

regret theory effect	0.630**	-0.062	-0.031	0.655**	0.355**	0.200*	0.572**	0.695**	
Price tolerance	0.685**	-0.063	0.025	0.694**	0.263**	0.164	0.596**	0.625**	0.637**
** At the 0.01 level, the correlation is significant. * Significant at the 0.05 level.									

4.4 Correlation analysis

The results of Kruskal-Wallis test (table 3) indicate that there are significant differences in psychological perceptions, prospect theory perceptions, regret theory perceptions and price tolerance perceptions across occupation types. The p-values of all the tests were less than 0.001, which indicated that these perceptual variables differed significantly across occupation types. Post hoc tests showed that psychological perception, prospect theory perception, regret theory perception and price tolerance perception were significantly lower for school students than for other occupation types.

Table 3. Kruskal-Wallis test for the dependent variable under different occupation types

implicit variable	Type of occupation	N	M	W	P	Scheffe
psychological perception	student at school	36	18.69	78.405	＜0.001	
	Corporate Staff/White Collar	38	81.61			
	freelancer	21	77.19			A＜B、C、D、E
	Civil Servants/Enterprise Personnel	9	87.5			
	Self-employed/Entrepreneur	17	70.5			
prospect theory effect	student at school	36	18.5	78.657	＜0.001	
	Corporate Staff/White Collar	38	82.93			
	freelancer	21	74.29			A＜B、C、D、E
	Civil Servants/Enterprise Personnel	9	66.89			
	Self-employed/Entrepreneur	17	82.44			
regret theory effect	student at school	36	18.6	78.656	＜0.001	
	Corporate Staff/White Collar	38	81.38			
	freelancer	21	69.67			A＜B、C、D、E
	Civil Servants/Enterprise Personnel	9	79.78			
	Self-employed/Entrepreneur	17	84.59			
Price tolerance	student at school	36	18.67	77.182	＜0.001	

	Corporate Staff/White Collar	38	76.8			
	freelancer	21	75.05			A＜B、C、D、E
	Civil Servants/Enterprise Personnel	9	86.44			
	Self-employed/Entrepreneur	17	84.5			

Similarly, in table 4, there are significant differences in Psychological Perception, Prospect Theory Perception, Regret Theory Perception and Price Tolerance Perception at different levels of monthly disposable income. The p-values of all the tests are less than 0.05, indicating that there are significant differences in these perceptual variables for different levels of monthly disposable income. Post hoc tests show that the psychological perception and prospect theory perception of the group with monthly disposable income of $3,000 and below are significantly lower than those of the group with monthly disposable income of $6001-1,000,000, indicating that there is a significant effect of income level on these perceptual variables. In terms of regret theory perception, the $6001-10000 group is significantly higher than the $3000 and below group and the $3001-6000 group. The difference in perceived price tolerance across income levels also reached a significant level, but the post hoc test did not find a significant difference in price tolerance across monthly disposable income.

Table 4. Kruskal-Wallis test for the dependent variable at different income levels

implicit variable	income level	N	M	W	P	Scheffe
psychological perception	3000 yuan or less	46	50.11	16.345	＜ 0.01	
	B. 3001-6000 yuan	43	58.71			
	C. 6001-10000 yuan	19	83.55			A＜C
	D. 10001-15000 yuan	6	87.5			
	15001 yuan or more	7	62.71			
prospect theory effect	3000 yuan or less	46	50.09	16.895	＜ 0.01	
	B. 3001-6000 yuan	43	57			
	C. 6001-10000 yuan	19	83.05			A＜C
	D. 10001-15000 yuan	6	82.17			
	15001 yuan or more	7	79.29			
regret theory effect	3000 yuan or less	46	51.09	21.711	＜ 0.001	
	B. 3001-6000 yuan	43	53.44			
	C. 6001-10000 yuan	19	86.87			C＞A、B
	D. 10001-15000 yuan	6	84.08			
	15001 yuan or more	7	82.57			
Price tolerance	3000 yuan or less	46	52.47	10.272	＜ 0.05	
	B. 3001-6000 yuan	43	59.02			
	C. 6001-10000 yuan	19	73.79			
	D. 10001-15000 yuan	6	67.17			
	15001 yuan or more	7	89.21			

4.5 Regression analysis

Table 5 shows that variables with significant correlations were included in the regression analysis to explore the effects of the variables on the four perceptions, and the results of the regression analysis showed that the type of occupation and the level of income had a significant effect on psychological perception, prospect theory perception, regret theory perception, and price tolerance perception. Specifically, occupation type has a significant

effect on psychological perception, prospect theory perception, regret theory perception and price tolerance perception all had significant positive effects. Income level had a significant positive effect on psychological perception, prospect theory perception, regret theory perception and price tolerance perception also had significant positive effects. In terms of model fit, the models for psychological perception, prospect theory perception, regret theory perception , and price tolerance perception all showed strong explanatory power, indicating that occupation type and income level are important factors influencing these perception variables.

Table 5. Regression results

	psychological perception			prospect theory effect			regret theory effect			Price tolerance		
	Beta	t	p	Beta	t	p	Beta	t	p	Beta	t	p
(Constant)		7.761	0.000		6.396	0.000		6.746	0.000		7.373	0.000
Type of occupation	0.58	8.289	0.000	0.60	9.134	0.000	0.64	10.265	0.000	0.66	10.468	0.000
income level	0.28	3.996	0.000	0.33	5.021	0.000	0.33	5.235	0.000	0.29	4.699	0.000
R	0.654			0.7			0.735			0.733		
R2	0.428			0.49			0.54			0.537		
F	44.137***			56.799***			69.302***			68.502***		

*p < 0.05, **p < 0.01, ***p < 0.001

5 Conclusion

The age factor was found to be strongly related to individuals' psychological perceptions, prospect theory effects (sensitivity to gains and losses), regret theory effects (avoidance of potential regrets), and price tolerance. Specifically, increasing age showed a clear positive effect: older respondents gave generally higher ratings on the relevant scales. This suggests that as individuals grow older, they are more likely to experience worries and regrets in their consumption decisions, and that the enhancement of this emotional state directly weakens their purchase intention, reflecting a more cautious consumption mindset. Among all occupational groups, civil servants and entrepreneurs scored particularly well on indicators measuring psychological perceptions and theoretical effects, suggesting that members of this group have a higher perceptual acuity for potential gains and losses, making their decision-making behaviors more susceptible to expected gains or possible losses. In addition, income level also proved to be an important influencing factor. The analysis shows that the high-income group exhibits a stronger focus on dynamic price changes compared to the low-income group, a difference that also suggests variability in consumption habits due to different incomes.

For the status and income of different groups of people subscribing to the hotel, the hotel can adopt different dynamic pricing strategies, such as: for students or lower income groups, there is no need to adopt more complex dynamic pricing strategies, because this group of people do not receive a high degree of influence from the prospect theory effect and the regret theory effect, this kind of people seldom obsessed with their own gains and losses, they may be more focused on the services and experiences provided by the hotel. For the middle and high income and occupation for civil servants, white-collar workers and other status of the customer groups, the hotel should take a more sophisticated dynamic pricing strategy, as far as possible to maintain the strength of the concessions, do not

frequently raise or lower the price of the room, which will make this type of customer groups have a sense of gain or loss of interest, easy to worry about or regret the mood of the impact of the willingness to buy, but the reasonable use of this psychological Price adjustment can also be used to gain greater profits.

This study adopts the questionnaire survey method, which may have a sample bias that affects the generalizability and accuracy of the results.

The study only deals with some of the influencing factors and does not fully consider other factors that may affect tourists' behavioral intentions, such as product quality, consumer preferences, etc. The data of the study are cross-sectional and the causal relationship between variables cannot be determined, and the explanation of the dynamic decision-making process is limited.

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