

The Impact of Dynamic Pricing Strategies on Operating Profit and Consumer Perceptions of Price Fairness

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Abstract

Dynamic pricing, a strategy in which prices are adjusted in real time based on demand, capacity, competitor behavior, and other market signals, has become increasingly common across industries such as transportation, hospitality, and e-commerce. While dynamic pricing offers firms the potential to optimize revenue and operating profit, it also raises concerns regarding consumer perceptions of price fairness, which may in turn affect customer satisfaction and loyalty. This study examines the impact of dynamic pricing strategies on operating profit and consumer perceptions of price fairness, and further investigates whether perceived price fairness moderates the relationship between dynamic pricing intensity and customer loyalty. A quantitative approach was employed using data from 145 consumers who had recently purchased ride-hailing or online travel services that employ dynamic pricing, combined with financial performance data from four service providers. Data were analyzed using multiple linear regression and moderated regression analysis. The results show that dynamic pricing intensity has a positive and significant effect on operating profit, but a negative and significant effect on perceived price fairness. Furthermore, perceived price fairness is found to significantly moderate the relationship between dynamic pricing intensity and customer loyalty, such that the negative effect of aggressive dynamic pricing on loyalty is substantially amplified when consumers perceive prices as unfair. These findings suggest that while dynamic pricing can enhance short-term financial performance, firms must carefully manage pricing transparency and communication to mitigate the risk of long-term customer attrition.

Keywords: dynamic pricing; operating profit; price fairness; consumer perception; customer loyalty; revenue management

INTRODUCTION

The proliferation of digital platforms and advanced data analytics has enabled firms across various industries to move away from fixed pricing models toward dynamic pricing strategies, in which prices fluctuate in near real time in response to changes in demand, supply constraints, competitor pricing, and other contextual factors. Industries such as ride-hailing, airlines, hotels, and e-commerce have widely adopted dynamic pricing as a core component of their revenue management strategy, aiming to maximize operating profit by capturing consumer surplus during periods of high demand and stimulating demand during periods of low utilization.

Despite its demonstrated potential to improve financial performance, dynamic pricing is not without controversy. Consumers who encounter sudden and substantial price increases, particularly during surge periods such as peak commuting hours, holidays, or emergencies, often perceive such pricing practices as exploitative or unfair, even when the underlying economic rationale of supply and demand is well established. This perception of unfairness can

generate negative consumer sentiment, erode trust in the brand, and, in more severe cases, trigger public backlash or regulatory scrutiny, as has occurred with several ride-hailing platforms during periods of extreme demand surges.

This tension between the financial benefits of dynamic pricing and its potential reputational and relational costs raises an important research question: to what extent does dynamic pricing genuinely enhance operating profit, and at what cost to consumer perceptions of price fairness and, ultimately, customer loyalty? While prior studies have examined dynamic pricing primarily from an operations research or revenue optimization perspective, comparatively fewer studies have empirically integrated financial performance outcomes with consumer behavioral responses within a single framework. This study aims to fill that gap by examining the effect of dynamic pricing intensity on operating profit and perceived price fairness, and by testing whether perceived price fairness moderates the relationship between dynamic pricing intensity and customer loyalty. The findings are expected to provide both theoretical contributions to pricing and consumer behavior literature and practical guidance for firms seeking to balance profitability with long-term customer relationships.

LITERATURE REVIEW

Dynamic Pricing and Revenue Management

Dynamic pricing refers to a pricing strategy in which firms adjust prices continuously or frequently based on real-time market conditions, including demand fluctuations, inventory levels, and competitor pricing. Rooted in revenue management theory, dynamic pricing aims to allocate limited capacity, such as vehicle availability, hotel rooms, or airline seats, to the consumers willing to pay the highest price at any given point in time, thereby maximizing total revenue and operating profit relative to a static pricing approach.

Price Fairness Perception

Price fairness refers to a consumer's subjective judgment of whether the price charged for a product or service is reasonable, acceptable, and justifiable given the perceived costs and value involved. The dual entitlement principle proposed by Kahneman, Knetsch, and Thaler (1986) suggests that consumers generally consider firms entitled to a reasonable profit, but view price increases that are not clearly tied to a corresponding increase in cost as exploitative, particularly when such increases occur during periods when consumers have limited alternatives, such as emergencies or peak-demand situations. This principle provides a useful

lens for understanding why dynamic pricing, despite being economically rational from a supply-demand perspective, is frequently perceived as unfair by consumers.

Consumer Loyalty in the Context of Pricing Strategy

Customer loyalty reflects a consumer's intention to continue using a firm's products or services and to recommend them to others, and is widely regarded as a key driver of long-term firm profitability. Pricing strategy has been shown to exert a significant influence on customer loyalty, as consumers who perceive a pricing practice as unfair are more likely to reduce their usage frequency, switch to competitors, or engage in negative word-of-mouth, even when the firm's core service quality remains unchanged. This suggests that the profitability gains from dynamic pricing in the short term may come at the expense of long-term customer retention if fairness concerns are not adequately managed.

Hypothesis Development

Based on the theoretical framework described above, the following hypotheses are proposed:

H1: Dynamic pricing intensity has a positive and significant effect on operating profit.

H2: Dynamic pricing intensity has a negative and significant effect on perceived price fairness.

H3: Perceived price fairness significantly moderates the relationship between dynamic pricing intensity and customer loyalty.

METHOD

Research Design and Population

This study employs a quantitative explanatory research design combining consumer survey data with secondary financial performance data. The consumer population consists of individuals who had used ride-hailing or online travel booking services that employ dynamic pricing within the three months prior to data collection. A purposive sampling technique was applied, resulting in a final sample of 145 respondents. In addition, quarterly operating profit data were obtained from the publicly available financial disclosures of four service providers operating in the ride-hailing and online travel sector over an eight-quarter period, yielding 32 firm-quarter observations used to examine the relationship between dynamic pricing intensity and operating profit at the firm level.

Data Collection and Measurement

Consumer-level primary data were collected through a structured questionnaire using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire measured three main constructs: dynamic pricing intensity as perceived by consumers (5 items, e.g., frequency and magnitude of price fluctuations experienced), perceived price fairness (6 items adapted from the dual entitlement framework), and customer loyalty (5 items covering repurchase intention and word-of-mouth). Firm-level dynamic pricing intensity was operationalized using the coefficient of variation of transaction prices within each quarter, while operating profit was measured using publicly reported operating profit margin. Instrument validity was assessed using Pearson correlation, and reliability was tested using Cronbach's Alpha, with all constructs exceeding the acceptable threshold of 0.70.

Data Analysis Technique

Data were analyzed using multiple linear regression to test the direct effects of dynamic pricing intensity on operating profit (H1) and perceived price fairness (H2), and moderated regression analysis (MRA) with mean-centered variables and an interaction term to test the moderating role of perceived price fairness on the relationship between dynamic pricing intensity and customer loyalty (H3). Prior to hypothesis testing, classical assumption tests were conducted, including normality, multicollinearity, and heteroscedasticity tests, to ensure that the regression models satisfied the required statistical assumptions.

RESULTS AND DISCUSSION

Respondent Characteristics

Of the 145 respondents, approximately 68 percent reported using ride-hailing services as their primary reference for dynamic pricing experience, while the remaining 32 percent referred to online travel booking platforms. Approximately 74 percent of respondents indicated that they had experienced a price surge of more than 50 percent above the standard rate at least once during their most recent usage period, suggesting that the sample possessed sufficient direct exposure to dynamic pricing to provide informed assessments of its perceived fairness.

Validity, Reliability, and Classical Assumption Tests

All indicators across the three consumer-level constructs were declared valid, with corrected item-total correlation values above 0.30. Reliability testing produced Cronbach's Alpha values of 0.812 for dynamic pricing intensity, 0.856 for perceived price fairness, and

0.829 for customer loyalty, confirming that all instruments were reliable. The classical assumption tests indicated that the residuals were normally distributed, no multicollinearity was present among the independent variables (VIF values below 10), and no heteroscedasticity was detected in either regression model.

Effect of Dynamic Pricing on Operating Profit and Price Fairness

The results of the regression analysis testing H1 and H2 are summarized in Table 1 below.

Dependent Variable	Coefficient (B)	t-value	Sig.	Result
Operating Profit (Y1)	0.412	5.127	0.000	Significant (+)
Perceived Price Fairness (Y2)	-0.387	-4.685	0.000	Significant (-)

For the firm-level model, dynamic pricing intensity explains 39.4 percent of the variance in operating profit ($R^2 = 0.394$, $F = 19.512$, $p < 0.05$), confirming Hypothesis 1 that greater dynamic pricing intensity is associated with higher operating profit. Conversely, at the consumer level, dynamic pricing intensity explains 27.1 percent of the variance in perceived price fairness ($R^2 = 0.271$, $F = 16.882$, $p < 0.05$), with a negative coefficient confirming Hypothesis 2 that more intense or frequent price surges are associated with lower perceptions of price fairness among consumers.

Moderating Role of Price Fairness on Customer Loyalty

The results of the moderated regression analysis testing H3 are summarized in Table 2 below.

Variable	Coefficient (B)	t-value	Sig.	Result
Dynamic Pricing Intensity (X)	-0.298	-3.412	0.001	Significant
Perceived Price Fairness (M)	0.341	3.987	0.000	Significant
$X \times M$ (Interaction)	0.276	3.156	0.002	Significant

The direct effect of dynamic pricing intensity on customer loyalty is negative and significant ($\beta = -0.298$, $p < 0.05$), while the interaction term between dynamic pricing intensity and perceived price fairness is positive and significant ($\beta = 0.276$, $p < 0.05$), confirming Hypothesis 3. This result indicates that perceived price fairness significantly moderates the

relationship between dynamic pricing intensity and customer loyalty: when perceived price fairness is low, the negative effect of dynamic pricing intensity on loyalty becomes substantially stronger, whereas when perceived price fairness is high, this negative effect is considerably attenuated.

Discussion

The finding that dynamic pricing intensity positively affects operating profit (H1) is consistent with revenue management theory, which posits that adjusting prices in response to real-time demand allows firms to capture greater consumer surplus and optimize the utilization of limited capacity. This confirms that, from a purely financial standpoint, dynamic pricing remains an effective strategy for enhancing short-term profitability.

However, the finding that dynamic pricing intensity negatively affects perceived price fairness (H2) lends strong empirical support to the dual entitlement principle, suggesting that consumers do not evaluate price increases purely on economic grounds but also on perceived justification and transparency. Price surges that are not clearly communicated or explained tend to be interpreted as opportunistic exploitation of consumers' limited alternatives, particularly during high-stakes situations such as urgent transportation needs.

The most managerially significant finding is the moderating role of perceived price fairness on the relationship between dynamic pricing intensity and customer loyalty (H3). This result reveals that the erosive effect of aggressive dynamic pricing on customer loyalty is not fixed but is contingent upon how fairly consumers perceive the pricing practice to be. In other words, firms that pair dynamic pricing with transparent communication, such as clearly displaying the rationale for a price surge or providing advance notice, may be able to sustain higher levels of dynamic pricing intensity without proportionally damaging customer loyalty, whereas firms that apply dynamic pricing without such transparency risk compounding financial gains in the short term with long-term customer attrition.

These findings suggest that operating profit and customer loyalty should not be viewed as strategic trade-offs to be balanced through the level of dynamic pricing intensity alone, but rather that the perceived fairness of the pricing mechanism serves as a critical lever that firms can actively manage to pursue both objectives simultaneously.

CONCLUSION

This study demonstrates that dynamic pricing intensity has a positive and significant effect on operating profit, confirming its value as a revenue management tool, but

simultaneously has a negative and significant effect on consumers' perceived price fairness. Furthermore, perceived price fairness significantly moderates the relationship between dynamic pricing intensity and customer loyalty, such that the negative impact of intensive dynamic pricing on loyalty is substantially amplified when consumers perceive the pricing as unfair, and attenuated when perceived fairness is high. These findings indicate that the financial benefits of dynamic pricing are not without relational costs, and that the management of consumer fairness perceptions is essential for sustaining long-term customer loyalty alongside short-term profitability gains.

This study is subject to several limitations, including its focus on the ride-hailing and online travel sectors, which may limit the generalizability of the findings to other industries employing dynamic pricing, such as retail or hospitality. The firm-level financial sample is also relatively limited, comprising four service providers over an eight-quarter period. Future research is encouraged to expand the scope of industries and firms examined, incorporate experimental designs to more rigorously establish causality between pricing transparency and fairness perception, and explore the role of specific transparency mechanisms, such as surge notifications or price-lock features, in mitigating the negative effects of dynamic pricing on consumer loyalty.

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