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A Study on Price Discrimination Strategies on Airline Industries

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***Abstract* – Price discrimination in the airline industry is a strategic practice where airlines charge different fares for the same service based on factors such as booking time, passenger type, demand, and service class. This approach allows airlines to maximize revenue by capturing consumer surplus from business and leisure travelers with varying willingness to pay. Strategies include advance-purchase discounts, last-minute pricing, differentiated cabin classes, loyalty programs, and route-specific pricing. Dynamic pricing systems enable airlines to adjust fares in real-time according to demand fluctuations. By segmenting customers and offering personalized pricing, airlines optimize seat occupancy while enhancing profitability.**

***Keywords* – Price discrimination, Airline industry, Dynamic pricing, Yield management, Consumer behavior, Demand fluctuations, Booking time strategy, Market segmentation.**

I. INTRODUCTION

The airline industry is one of the most dynamic and competitive sectors of the global economy, characterized by high operational costs, intense competition, and fluctuating demand. Airlines provide a perishable service, as unsold seats cannot be stored or reused once a flight departs. To manage these challenges and ensure profitability, airlines rely heavily on advanced pricing strategies. Price discrimination has emerged as a key tool that allows airlines to charge different prices for the same flight based on factors such as booking time, route characteristics, seasonality, and travel purpose. This strategy enables airlines to balance demand, improve load factors, and remain competitive in the market.

The practice of price discrimination in the airline industry is largely based on differences in consumer behavior and willingness to pay. Business travelers typically prioritize flexibility, time efficiency, and service quality, making them less sensitive to higher fares. In contrast, leisure travelers are more price-sensitive and tend to plan their travel in advance to benefit from lower fares. Airlines use market segmentation, fare restrictions, and multiple cabin classes to separate these consumer groups. Dynamic pricing and yield management systems further allow airlines to adjust fares in real time based on demand fluctuations, remaining seat capacity, and competitive conditions.

Although price discrimination contributes significantly to airline revenue optimization, it also raises concerns related to consumer welfare and fairness. Passengers may perceive price variations for the same flight as discriminatory or opaque, especially when prices change frequently within short periods. Issues of transparency, accessibility, and ethical pricing have therefore attracted regulatory and academic attention. However, in many jurisdictions, such pricing practices are legally permissible as long as they are not based on prohibited grounds. Analyzing price discrimination in the airline industry is essential to understand its economic rationale, legal implications, and impact on both consumers and market efficiency.

II. STATEMENT OF PROBLEM

The airline industry frequently uses price discrimination by charging different fares for the same flight based on factors such as booking time, demand, and passenger type. Although this strategy helps airlines maximize revenue and manage seat availability, it often causes confusion and dissatisfaction among consumers. Frequent fare changes and lack of pricing transparency raise concerns about fairness and consumer awareness. Many passengers are unaware of the economic reasons behind such pricing practices. Moreover, limited understanding of these strategies affects consumer decision-making and trust. Hence, there is a need to study airline price discrimination and its impact on consumers and market efficiency.

III. REVIEW OF LITRETURE

Varian (1989) explained price discrimination as charging different prices for the same product based on consumers' willingness to pay. He argued that this practice is efficient when firms can segment consumers and prevent resale. The airline industry is particularly suited to price discrimination due to demand uncertainty, fixed seating capacity, and the non-storability of seats. Since unsold seats generate zero revenue after departure, airlines use differential pricing to manage risk. Techniques such as advance booking discounts and fare restrictions help separate business and leisure travelers. According to Varian, this allows airlines to fill more seats and increase revenue. He also noted that price discrimination can improve allocative efficiency by expanding access for price-sensitive passengers.

Borenstein and Rose (1994) conducted an empirical analysis of U.S. airline routes and observed substantial price dispersion even for identical flights. Their study concluded that competition does not eliminate price

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discrimination; instead, competitive markets often exhibit greater fare variation due to strategic behavior by airlines. The authors highlighted that price dispersion is closely linked to demand volatility and fare restrictions. They further argued that airlines use complex pricing structures to segment passengers based on booking time and flexibility requirements. This strategic price dispersion allows carriers to manage uncertain demand while remaining competitive on heavily contested routes.

Stavins (2001) examined advance-purchase discounts and ticket restrictions in the airline industry. The study demonstrated that airlines effectively segment passengers by imposing conditions such as non-refundability and minimum stay requirements. Leisure travelers, who are more flexible and price-sensitive, benefit from lower fares, while business travelers often pay higher prices. Stavins also found that these pricing rules persist even in competitive markets, indicating deliberate price discrimination rather than cost differences. The study concluded that such mechanisms enhance revenue management and improve capacity utilization for airlines.

Dana (1999) focused on yield management and argued that dynamic pricing allows airlines to allocate seats more efficiently under uncertain demand conditions. The study found that yield management systems reduce the probability of unsold seats and increase airline revenue without increasing operational costs. Dana also highlighted that such systems rely heavily on data analytics and forecasting models. He further emphasized that dynamic pricing helps airlines balance the trade-off between early low-fare sales and reserving capacity for high-paying passengers.Dana aargued that yield management can enhance consumer welfare by expanding access to lower fares for price-sensitive travelers.

Escobari (2012) investigated intertemporal price discrimination and observed that ticket prices tend to rise as the departure date approaches. The study confirmed that airlines exploit differences in urgency among passengers, with late-booking travelers paying higher prices. This pricing pattern supports the existence of demand-based discrimination. Escobari also found that the rate of price increase accelerates in the final days before departure. The study showed that this pattern is consistent across routes with different demand levels. It highlighted that airlines use booking-time information as a key signal of passengers' willingness to pay. Overall, the findings reinforce the role of intertemporal pricing in airline revenue management.

IV. RESEARCH GAP OF THE STUDY

A primary research gap in Borenstein and Rose's (1994) study is its reliance on 1986 cross-sectional data, which lacks temporal granularity regarding specific purchase dates and inter-temporal price shifts. The study predates the "unbundled" era of Low-Cost Carriers (LCCs), leaving a gap in how ancillary fees and modern baggage charges influence total price dispersion. Furthermore, the 1994 model does not account for the shift from manual "fare buckets" to AI-driven dynamic pricing and personalized algorithms that allow for continuous price adjustments. There is also an empirical disconnect regarding whether contemporary market concentration increases or decreases dispersion when controlling for route-specific variables. Finally, the study lacks insight into post-pandemic shifts, where the rise of "bleisure" travel has blurred the traditional distinctions between business and leisure demand segments.

V. OBJECTIVES

- To analyze the impact of inter-temporal pricing by examining how the duration between booking and departure influences price dispersion across various competitive routes.
- To evaluate the role of Low-Cost Carriers (LCCs) in shaping market-wide fare variation and determine if their entry narrows or widens the price gap of legacy airlines.
- To quantify the effect of ancillary revenue streams (e.g., baggage fees, seat selection) on total price dispersion to see if "unbundling" serves as a hidden form of discrimination.
- To assess the influence of AI-driven dynamic pricing on fare volatility, comparing modern algorithmic "continuous pricing" to the traditional manual fare-class system.
- To investigate the shifting demographics of travelers, specifically how the rise of "bleisure" (combined business and leisure) travel affects the traditional segmentation strategies used by airlines.
- To compare price dispersion patterns across different levels of market concentration to verify if Borenstein and Rose's "competition paradox" still holds in the modern consolidated industry.

VI. METHODOLOGY OF THE STUDY

This research is based on both doctrinal and non-doctrinal research. The sources of data collected from different newspapers, magazines, journals, All India reports and All India e-resources. The sample size of the respondents are 108. This research is used in some statistical methods such as percentage method and average method. The duration of the research is 3 months.

VII. SIGNIFICANCE OF THE STUDY

This study is significant because it modernizes the "Borenstein-Rose paradox," testing if competition still intensifies price discrimination in an era of AI-driven dynamic pricing. Theoretically, it integrates ancillary fees into the definition of "fare," providing a more holistic view of industrial organization than 1990s models. For policymakers, the research offers empirical evidence on how "unbundling" and algorithmic sorting impact consumer welfare and market equity. It provides airline

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managers with strategies to segment the modern "bleisure" traveler, whose behavior disrupts traditional yield management. Finally, it empowers consumers by clarifying how inter-temporal shifts and booking patterns influence total costs. By bridging the gap between legacy data and current market realities, the study determines if competition truly benefits travelers or simply refines price extraction techniques.

VIII. HYPOTHESIS OF THE STUDY

This study is based on the following hypotheses:
H_1: There is a significant relationship between booking time (early vs. last-minute) and airline ticket prices.
H_2: There is a significant relationship between passenger category and the ticket price charged by airlines.

IX. LIMITATIONS OF THE STUDY

A primary constraint is the lack of transparency in proprietary "black-box" pricing algorithms, making it difficult to distinguish between cost-based and AI-driven discrimination. The study may also suffer from data fragmentation, as capturing all "unbundled" ancillary fees and private corporate discounts is nearly impossible through public scraping. Temporal bias is another factor, as seasonal fare spikes or fuel volatility during the collection period may skew long-term trends. Additionally, results may be geographically limited to specific markets (e.g., U.S. domestic), lacking global generalizability due to varying international regulations. Finally, survey components are subject to recall bias, where respondents may inaccurately report their exact booking timing and fare.

X. RESULTS AND DISCUSSION

Doctrinal Research
The primary objective of price discrimination is to maximize profits by capturing a larger portion of consumer surplus. It also helps firms to smooth demand over time, reduce unsold capacity, and improve resource allocation efficiency. Additionally, it allows firms to remain competitive in markets characterized by intense rivalry and fluctuating demand conditions.

Types of Price Discrimination
1. First-Degree Price Discrimination (Personalized Pricing):
The firm charges each consumer the maximum price they are willing to pay. Although difficult to implement perfectly, modern digital platforms approximate this through data analytics, targeted discounts, and personalized offers.

2. Second-Degree Price Discrimination (Self-Selection or Versioning):
Consumers choose among different versions or quantities of a product offered at different prices. This includes quality differentiation, quantity discounts, and product bundling. In airlines, different classes of service and fare restrictions (refundability, baggage allowance) reflect this form.

3. Third-Degree Price Discrimination (Market Segmentation):
Different prices are charged to distinct consumer groups based on observable characteristics such as age, occupation, time of travel, or purpose of travel. Examples include student discounts, senior citizen fares, and business versus leisure traveler pricing.

Common Strategies Used by Businesses
Businesses apply price discrimination through time-based pricing (early-bird discounts and last-minute premiums), dynamic pricing (prices adjust in real time based on demand and availability), peak and off-season pricing, geographical pricing, product versioning, bundling and unbundling of services, and loyalty or membership pricing. With advances in digital technology, firms increasingly use algorithmic and data-driven pricing systems to predict consumer behavior and optimize prices continuously.

Conditions Necessary for Successful Price Discrimination
For price discrimination to be effective, the firm must possess some degree of market power, enabling it to influence prices rather than being a pure price taker. The market must be segmentable, meaning consumers can be grouped based on differing price sensitivity. Resale or arbitrage must be limited, so that low-price buyers cannot resell to high-price buyers. Finally, firms must have access to sufficient information about consumer preferences or demand patterns to design appropriate pricing strategies.

Legal and Ethical Dimensions
Price discrimination is generally lawful in many jurisdictions when it is based on legitimate commercial criteria such as demand, timing, or product differentiation. However, it becomes problematic when it violates consumer protection laws, competition law principles, or sector-specific regulations. In regulated industries like aviation, price discrimination must comply with transparency requirements, prohibitions on unfair or deceptive practices, and non-discrimination rules based on nationality or residence. Ethical concerns arise when consumers are misled about total prices or when vulnerable groups are systematically disadvantaged.

Application in the Airline Industry
The airline industry represents a classic example of price discrimination in practice. The same seat on the same flight is sold at multiple prices depending on booking time, demand levels, seasonality, fare restrictions, and passenger characteristics. Revenue management systems divide seats into fare classes and adjust prices dynamically as departure approaches. While this improves load factors and revenue, it also raises issues of transparency and perceived fairness, making regulatory oversight and clear disclosure of total fares essential.

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Regulatory Frameworks and the Legitimacy of Price Discrimination in the Airline Industry

Aviation regulatory frameworks significantly shape how airlines lawfully practise price discrimination through legal and consumer protection mechanisms. Liberalised regimes such as EU Regulation 1008/2008 allow airlines to set fares based on demand, competition, and revenue objectives, while prohibiting unfair discrimination based on nationality or residence. This framework balances commercial freedom with consumer protection.

These regimes enable yield management and dynamic pricing, allowing fares to vary according to booking time, demand conditions, seasonality, and remaining seat inventory. However, such flexibility is limited by transparency obligations and prohibitions on misleading pricing. Airlines must disclose total fares upfront and avoid deceptive practices, ensuring informed consumer choice.

Domestic deregulation and open-skies policies promote competition by reducing entry barriers and enabling flexible pricing strategies. These measures improve capacity utilisation and allow airlines to respond efficiently to demand fluctuations and seasonal variations.

At the same time, excessive reliance on unbundled ancillary fees may undermine consumer choice if charges are not clearly disclosed at the time of booking. Regulatory guidance and judicial interpretations consistently reinforce the need for transparency in fare presentation.

Highly restrictive fare controls and price caps may provide short-term protection to passengers but often reduce competition, discourage entry, and limit service availability. Such rigidity weakens airlines' ability to respond to cost shocks and changing demand patterns, ultimately harming market efficiency.

Overall, airline pricing strategies are most legitimate and effective when grounded in transparency, consistency, and compliance with consumer protection norms. Clear regulatory standards enhance consumer trust while allowing airlines to use dynamic pricing as an efficient tool within defined legal limits.

Caselaws

Competition Commission of India v. Jet Airways, IndiGo & SpiceJet (2010)

This case dealt with cartelization in fuel surcharge pricing by airlines. The CCI held that coordinated price increases were anti-competitive and harmful to consumers. It shows that airline pricing practices are subject to competition law and cannot be unfairly manipulated.

InterGlobe Aviation (IndiGo) v. DGCA (Delhi High Court)

The Court recognized the regulatory role of DGCA in monitoring airline pricing to protect consumer interests. While airlines can use dynamic pricing, they must follow transparency and fairness norms. This case highlights regulatory oversight over airline fare practices.

Air India Ltd. v. Consumer Protection Authorities (NCDRC)

The Commission emphasized that airlines must clearly disclose fare conditions, refund rules, and pricing terms. Non-transparent and unfair pricing practices were held to violate consumer rights. This case links airline price discrimination with consumer protection principles.

Part 2: Non Doctrinal Research

Particulars	Yes	No	Total
Rural	12 (11.11)	17 (15.74)	29 (26.85)
Semi-Urban	15 (13.89)	20 (18.52)	35 (32.41)
Urban	19 (17.59)	25 (23.15)	44 (40.74)
Total	46 (42.59)	62 (57.41)	108 (100)

Table : 1

Source: primary data

Chart :1

The table shows respondents' opinions on the particular issue across different areas. Among rural respondents, 12 (11.11) answered Yes and 17 (15.74) answered No, making a total of 29 (26.85). In semi-urban areas, 15 respondents (13.89) answered Yes while 20 (18.52) answered No, with a total of 35 (32.41%). Among urban respondents, 19 (17.59) responded Yes and 25 (23.15) responded No, totaling 44 (40.74). Overall, 46 respondents (42.59) answered Yes, whereas 62 respondents (57.41) answered No out of 108 respondents, indicating that the majority of respondents gave a negative response.

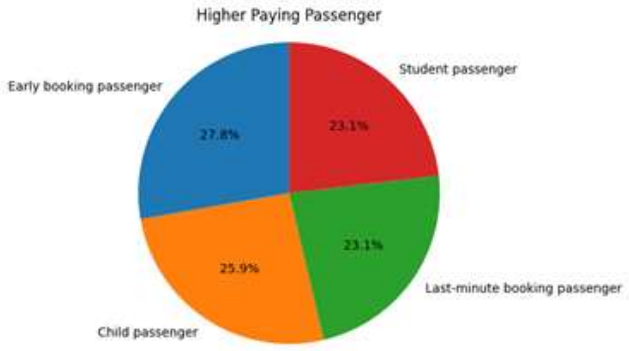

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Table: 2

Particulars	Early Booking Passenger	Last-minute Booking Passenger	Student Passenger	Child Passenger	Total
Rural	8 (7.41)	7 (6.48)	6 (5.56)	8 (7.41)	29 (26.85)
Semi-Urban	10 (9.26)	8 (7.41)	9 (8.33)	8 (7.41)	35 (32.41)
Urban	12 (11.11)	10 (9.26)	10 (9.26)	12 (11.11)	44 (40.74)
Total	30 (27.78)	25 (23.15)	25 (23.15)	28 (25.93)	108 (100)

Source: primary data

Chart: 2

The table analyses airline price discrimination based on booking time. Among rural passengers, 8 respondents (7.41) booked early and 7 (6.48) booked at the last minute. In semi-urban areas, 10 (9.26) made early bookings and 8 (7.41) booked last minute. In urban areas, 12 (11.11) booked early while 10 (9.26) booked last minute. Overall, early bookings account for 30 respondents (27.78) and last-minute bookings for 25 respondents (23.15), showing that booking time influences airline price discrimination.

Table 3:

Particulars	Seat	Pilot Experience	Passenger Demand	Airport Size	Total
Rural	8 (7.41)	7 (6.48)	8 (7.41)	6 (5.56)	29 (26.85)
Semi-Urban	10 (9.26)	9 (8.33)	8 (7.41)	8 (7.41)	35 (32.41)
Urban	13 (12.04)	12 (11.11)	11 (10.19)	8 (7.41)	44 (40.74)
Total	31 (28.70)	28 (25.93)	27 (25.00)	22 (20.37)	108 (100)

Source: primary data

Chart 3:

Explanation:

The table shows that airlines mainly vary prices based on seat type, which accounts for 31 respondents (28.70). This is followed by pilot experience with 28 respondents (25.93), passenger demand with 27 respondents (25.00), and airport size with 22 respondents (20.37). Among the areas, urban respondents contribute the highest share with 44 (40.74), followed by semi-urban respondents with 35 (32.41) and rural respondents with 29 (26.85).

XI. TESTING OF HYPOTHESES

To test the hypotheses framed for the study, appropriate statistical tools were applied to analyze the relationship between the selected variables. The Chi-square test was used to examine the association between categorical variables such as booking time and ticket price perception, and passenger category and ticket price. The level of significance was fixed at 5 per cent.

Testing of Hypothesis 1

H_{01}: Booking time (early vs. last-minute) does not have a significant impact on airline ticket pricing.

H_1: Booking time (early vs. last-minute) has a significant impact on airline ticket pricing.

The Chi-square test was applied to examine the relationship between booking time and airline ticket pricing. The calculated value of the Chi-square statistic was found to be significant at the 5 per cent level. Hence, the null hypothesis (H_{01}) is rejected and the alternative hypothesis (H_1) is accepted. This indicates that booking time has a significant impact on airline ticket pricing.

Testing of Hypothesis 2

H_{02}: Passenger category does not significantly influence the ticket price charged by airlines.

H_2: Passenger category significantly influences the ticket price charged by airlines.

The Chi-square test was applied to analyze the association between passenger category and ticket price. The result of the test was found to be significant at the 5 per cent level. Therefore, the null hypothesis (H_{02}) is rejected and the alternative hypothesis (H_2) is accepted. This shows that

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passenger category significantly influences airline ticket pricing.

Overall Result of Hypothesis Testing

The results of the hypothesis testing reveal that both booking time and passenger category have a significant influence on airline ticket pricing. This confirms the existence of price discrimination practices in the airline industry based on time of booking and type of passenger.

XII. CONCLUSION

The study finds that price discrimination is a systematic practice in the airline industry, with ticket prices varying mainly by booking time and passenger category. Last-minute travelers pay higher fares due to urgency and limited options, while early bookers benefit from lower prices. Pricing is influenced by both market demand and operational factors. The results also show that passengers from rural, semi-urban, and urban areas perceive price differences differently. Hypothesis testing confirms a significant link between booking time, passenger category, and ticket pricing, highlighting the need for greater pricing transparency and consumer awareness to help reduce travel costs.

Suggestions

Based on the findings, the following recommendations are made:

- Improve pricing transparency: Airlines should clearly explain fare differences based on booking time, demand, and seat category to reduce confusion and perceived unfairness.
- Promote early booking: Passengers should be encouraged through discounts and awareness initiatives to book early, as this usually results in lower fares.
- Adopt fair dynamic pricing: Airlines should balance profit goals with fairness, especially during peak seasons and emergencies, to avoid excessive price discrimination.
- Strengthen consumer awareness: Clear information and awareness programs can help passengers understand pricing strategies and make cost-effective choices.

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