

# **Dynamic Pricing in Different Industries**

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*Dynamic pricing describes a pricing strategy to set up highly flexible prices for products and services. Dynamic pricing algorithms adjust prices easily and frequently based on collected consumer data and market information. Dynamic pricing is used in various industries and has the potential to magnify revenues while offering multiple other benefits for companies. This paper analyzes the relevance and importance of dynamic pricing in sports, entertainment, leisure-time activities, hospitalities, and public transportation. For every industry, selected applications, and examples are analyzed. Finally, this paper investigates if dynamic pricing is fair and how customers respond to frequent price changes.*

*Keywords: dynamic pricing, revenue management, sports, entertainment, hospitalities, transportation, fairness*

## **INTRODUCTION TO DYNAMIC PRICING**

Within 40 years, products have been traditionally priced using a static approach. Static pricing has been used in different industries all over the world. By pricing products statically, prices are set in advance and remain unchanged. The main problem with static prices is that some products may be underpriced, resulting in a loss of revenue for many companies. Therefore, variable pricing strategies are increasingly important today (Sahin, 2018).

Dynamic pricing describes a pricing strategy for products and services to set up highly flexible prices and is commonly used for airline tickets or reserving hotel rooms online. Dynamic pricing techniques are used widely in various businesses. Typically, consumer data are collected, and algorithms adjust prices easily and frequently. For multiple businesses, different pricing models can be implemented (den Boer, 2013).

For most companies, dynamic pricing is essential to revenue management (RM). RM aims to predict real-time customer demand and optimize the price and availability of different products and services. It is one of the most implemented tools for hotels, rental car businesses, and airlines. Those industries have perishable products with fixed amounts of resources for which customers are willing to pay different prices. Customers are different, and management must find efficient ways to sell the right resources to the right

customers at the right time and at the right price (Phumchusri, 2013). Various dynamic pricing approaches do not require any cost or additional investments and are valuable strategies in RM (den Boer, 2013).

Besides increases in revenues, companies may benefit from dynamic pricing approaches for other reasons. Dynamic pricing can help to improve customer segmentation. Mostly, companies segment customers based on geographics and operations but rarely in terms of behavioral factors. Dynamic pricing approaches deliver companies data on customer behaviors, for example, what kind and how many customers buy at discount rates, and enhance customer segmentation. Second, companies can improve their forecasting methods. Many companies rely on one specific forecast model, leading to an inaccurate forecast. Additionally, companies use internal data instead of external and competitive data sources, which can be problematic in predicting complex business needs. Dynamic pricing enables a greater focus on sophisticated forecasting because it monitors the activities of customers and competitors and the product demand and supply (Cuddihey, 2019).

Dynamic pricing also facilitates personalization. Personalized dynamic pricing means that companies set individual consumer prices dynamically for the same product or service depending on the consumer-identifying information (Priester, Robbert, & Roth, 2020). Personalized prices and loyalty offers for trustworthy customers can promote bundling and ancillary sales (Cuddihey, 2019). Those ancillaries are a rapidly growing source of revenue for different industries, such as airlines and sports events. Offering products at dynamic or personalized prices could further improve customer satisfaction and loyalty, leading to an even greater willingness to buy additional products or services (Kolbeinsson, Shukla, Gupta, Marla, & Yellepeddi, 2021).

The advantages of dynamic pricing are well known, but companies must be careful when implementing a dynamic pricing strategy. Customers can get irritated if they notice that they are subject to price discrimination (Priester et al., 2020). For example, when customers know how much they paid for their airline tickets, they might discover that they paid a considerably higher amount, leading to adverse customer reactions. Second, less customer loyalty can result from dynamic pricing and damage a company's brand loyalty. Additionally, the rising interest in dynamic pricing leads to increased competition. Many goods and service providers use dynamic pricing, which leads to intense competition among companies. Customers not loyal to any company will not hesitate to look for a better deal. The Internet facilitates competition because shoppers can quickly compare prices for the same products and services at several different businesses (Root, 2017).

Due to dynamic pricing's effectiveness in various industries, this pricing strategy has emerged as a very intriguing subject of study (Kemper & Breuer, 2016). This paper analyzes the relevance and importance of dynamic pricing in different industries. After describing the relevant economic aspects of dynamic pricing, dynamic pricing practices in sports, entertainment and leisure-time activities, hospitalities, and public transport will be presented. For every industry, selected current applications and examples will be presented. Finally, it will be analyzed if dynamic pricing is fair and how customers respond to changing prices.

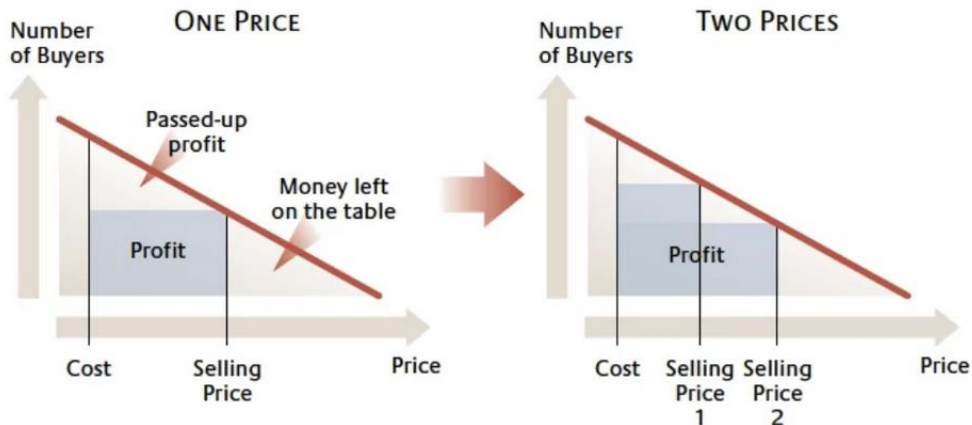
## **EFFECTIVENESS OF DYNAMIC PRICING**

The following figure (Figure 1) shows a simplified version of dynamic pricing. The demand curve depicts the relationship between the price (dependent variable) and the number of buyers (independent variable). A downward-sloping demand curve means that the lower the number of buyers, the higher the price companies can charge for their products or services. In this model, profit is the product of the number of buyers and the price.

Figure 1 demonstrates the effectiveness of dynamic pricing in comparison to static pricing. Having two prices increases the chance of generating more revenue while the number of consumers and the fixed and variable costs are unchanged. During peak periods, the firm can charge a premium price for the same good or service. Conversely, the firm can offer a discount for quiet periods to encourage greater consumption. In both cases, the overall revenue increases. In other words, having multiple price points allows firms to set

up higher or lower costs without additional selling costs (Teymouri, Khataie, Andreev, & Kuziemy, 2017).

**FIGURE 1**  
**EFFECTIVENESS OF DYNAMIC PRICING**



Teymouri et al., 2017

## DYNAMIC PRICING IN DIFFERENT INDUSTRIES

### Dynamic Pricing in Sports

Sports clubs generate revenues from three primary sources: broadcasting, commercial activities, and ticket sales. Ticket sales revenue is the most manageable source of income for sports clubs, and charging higher ticket prices can generate significantly higher revenues. Predictably higher revenues are necessary because many sports face higher financial obligations like transfer fees, stadium maintenance costs, or rising player salaries (Kemper et al., 2016).

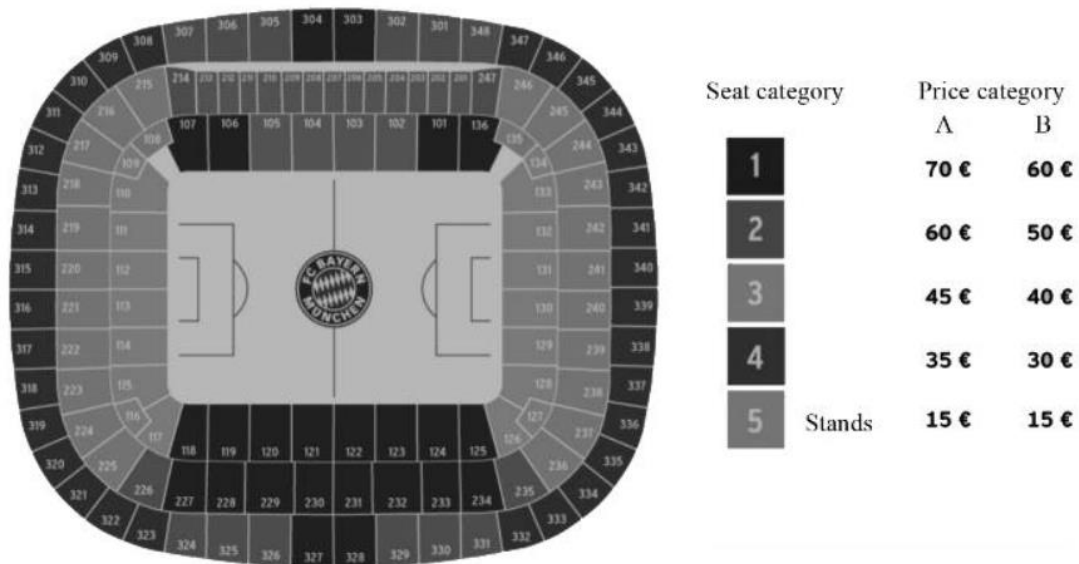
Dynamic pricing practices increase the chances that most seats will be occupied. Perishable sports tickets have to be sold before the game is over. Consequently, expired tickets will lose value and no longer generate revenues (Hinterhuber & Viberti, 2021). For most sports events, ticket sales usually start months before the beginning of the season starts. Demand for specific games may vary over time. For instance, demand fluctuates strongly due to the performances of host and away teams, weather conditions on the game day, or injuries of star players. Pricing tickets dynamically increases the chances that sports clubs will have satisfying sales figures over time. Second, sports games with dynamic pricing approaches have a low marginal sales cost. For example, suppose there is a need to host an additional spectator in the stadium. In that case, the club does not have a considerable marginal cost because clubs generate additional revenue from selling merchandise and food (Sahin, 2018).

Dynamic pricing can be a valuable strategy for American baseball and has become the norm for most teams. The San Francisco Giants introduced dynamic ticket pricing as the first baseball team in 2009. The San Francisco Giants noticed that ticket demand for each game fluctuated during the season. The Giants started using a dynamic pricing model by considering varying player performance, the day of the week, the opposing team, and the weather during the season. As a result, the San Francisco Giants could generate an additional \$500,000 in incremental revenue in 2009 and increase their overall revenue by 7% in 2010 (Shapiro & Drayer, 2014).

Soccer teams may benefit from dynamic ticket pricing, too. Typically, European soccer clubs like Bayern Munich use a simple form of ticket pricing based on only two dimensions: seat category and price category (Figure 2). There are five seat categories, and the distance to the field determines each category and whether the seat is located behind the goal, on the sideline, or behind. Seats closer to the field are priced higher than seats farther away with an inferior view. The price category relates to the quality of the

opponent. For Bayern Munich, the 2013-14 season games were categorized as A or B games. The price difference between A and B games is €5 or €10, depending on the seat category. However, research revealed that stadium attendees are willing to pay a significantly higher price for tickets compared to Bayern Munich's current ticket price (Kemper et al., 2016).

**FIGURE 2**  
**TRADITIONAL TICKET PRICING STRUCTURE OF BAYERN MUNICH FOR THE 2013-14 SEASON**



Kemper et al., 2016

Kemper et al. applied the mathematical theory of dynamic pricing to estimate a demand function before building a price optimization model. To determine the necessary eight demand functions, models were estimated based on an evaluation of the ticket auctioning on eBay.de. Kemper et al. showed that attendees are willing to pay significantly more when tickets are priced dynamically, thereby presenting opportunities for a massive revenue increase. The average willingness to pay varied based on the seat and price category, from €70 to €178 (Kemper et al., 2016).

Sahin et al. proposed a dynamic pricing model for soccer games that can also be applied to other sports events. According to Sahin et al.'s pricing model, prices adjust depending on multipliers that account for the impacts of time and inventory. Dynamic prices are obtained by multiplying the mean season ticket price, used as the reference price, with the inventory and time multipliers. Demand rates are needed for this model as well. Sahin et al. showed that implementing this model can increase total revenue by 8.95%. The results of the pricing model were found to be competitive and effective (Sahin & Erol, 2019).

Dutta showed that when the demand is generally high, it is optimal for a club to sell all tickets by itself. On the other hand, dynamic ticket pricing becomes more valuable for less popular games with considerable fluctuation in demand. When ticket demand is relatively low, clubs should retain only 20–40% of the tickets, and the rest of the capacity should be sold by online retailers. These tickets will be sold via the secondary market by online retailers such as Ticketmaster and Vivid Seats (Dutta, 2019).

Today, more and more European sports organizations have also started to apply a dynamic pricing strategy. For example, in Italy, Virtus Calcio Entella (football) and Auxilium Pallacanestro Torino (basketball) are pioneers of a dynamic pricing approach. Research suggests that barriers to dynamic pricing still include fear of irritating customers or unexpectedly high implementation costs. However, experiences

of dynamic pricing implementations are positive, and companies in different sports sectors can significantly benefit from dynamic pricing practices (Hinterhuber et al., 2021).

### **Dynamic Pricing in Entertainment and Leisure-Time Activities**

The theater industry is an example of a non-travel industry that can magnify revenues by implementing an effective dynamic pricing approach. Connolly and Krueger analyzed a sample of major concerts and revealed that artists left about 5 percent of potential income, or around \$200 million, in 2006 due to underpricing tickets relative to the market rate (Irwin, 2017).

However, dynamic price is still less known in the non-travel (Choi, Jeong, & Mattila, 2014). Phumchusri investigated transaction sales from 117 classical concert tickets regarding the used pricing methods. Fixed pricing is still the most appropriate model in the theater industry. Specific days of shows, for example, Saturday shows, were priced higher than others, but the difference was very minimal. At the end of the season, usually from February to April, tickets had lower prices than at the beginning. The ticket rates were unlikely to change within shorter periods (Phumchusri, 2013). Although movie theaters have relatively fixed capacities, fluctuating and uncertain demand, and perishable inventories as prerequisites for dynamic pricing implementations, many still do not use those approaches (Choi, Jeong, & Mattila, 2014).

However, there are some examples where dynamic pricing has positive influences. The Lion King is a great example of how dynamic ticket pricing can lead to huge increases in revenues. Since 2011, The Lion King has relied on an undisclosed computer algorithm to recommend the highest ticket prices that audiences would likely pay. This algorithm is a piece of software that suggests costs for five different kinds of shows based on information from 11.5 million audience members. Depending on popular dates like Christmas, off-peak dates like a weekday in February, and times in between, the cost of the tickets can range from \$80 to \$140. The introduction of the algorithm, in combination with heavy advertising, generated massive increases in revenues. For example, in March 2014, The Lion King generated a revenue of \$1.5 million a week besides a strong increase in consumer demand, from 50,000 attendees in 2008 to 700,000 in 2013 (Healy, 2014).

Stars like Taylor Swift, U2, and the Eagles have also moved to a dynamic pricing strategy. In 2018, Taylor Swift's North American shows generated a revenue of \$277 million, which is about 40 percent higher than the revenue from her "1989" tour in 2015. Despite performing 35 percent fewer shows, only 40 shows for "Reputation" versus 62 for her "1989", revenues went up. Tickets were sold at approximately a 15 percent higher price than in 2015, and 700 seats were, on average, still available an hour before the start of each of Taylor Swift's shows. Despite some backfire reactions, many experts see this approach as the future of ticket pricing (Morgan, 2018).

Dynamic pricing strategies are getting more and more popular for leisure services, such as golf courses and ski resorts. Several ski resorts in the US and Switzerland have begun to use a dynamic pricing approach. On the one hand, such a pricing strategy is risky because customers with a high willingness to pay may switch to lower-priced offers, which may lead to collapses in revenue. On the other hand, with the right dynamic pricing strategy, companies can benefit from it in terms of revenue increases and customer loyalty. Malasevska et al. found evidence that dynamic pricing induces greater demand and can increase revenue by 0.5% to 7.5%. Skiers have a strong preference and higher willingness to pay for skiing conditions related to good weather. On the other hand, Malasevska et al. recommended that ski resort managers find effective ways to communicate the value of a skiing experience so that customers understand why prices vary on different days (Malasevska, Haugom, Hinterhuber, Lien, & Mydland, 2020).

Disney World is another example of dynamic pricing in leisure services. Disney is one of the first major players in theme parks that uses a demand-driven pricing model. The model considers seasonality and charges different ticket prices depending on peak, average, or value times. Visitors can book tickets online by using an interactive calendar. This interactive calendar enables customers to request the lowest prices for various lengths of stay in various months, and a lower price will be offered for longer stays. For example, ticket prices for single-day tickets across all Disney World parks will be the same, ranging from \$109 to \$129, depending on the date. According to Disney, people like this type of pricing because it allows

choosing visits based on the customer's situation and lets visitors find the best deal. On the other hand, Disney avoids overcrowding and uses dynamic pricing to increase revenues (Jelski, 2018).

### **Dynamic Pricing in Hospitality**

Hotels change their room rates daily or even within a day concerning up-to-the-minute market information. Vives et al. found that the number of rooms available, the hotel location, and the specific tourist profile affect available rates for hotel rooms (Vices & Jacob, 2020). Because hotel rooms are offered online and by third-party retailers, the distribution channel also matters. Bigne et al. found that the time horizon and different channel types are the main drivers for the offered rates. After analyzing 39,363 bookings for 1,085 hotels for 27 consecutive months, Bigne et al. found that ninety days in advance, online travel agencies offer lower prices compared to hotel websites and other global distribution channels. Thirty days in advance, the rates offered by hotel websites, online travel agencies, and global distribution systems were about the same. Hotel websites typically offer the lowest price level on the arrival day. Additionally, Bigne et al. found that the quality of the hotel, for instance, the number of stars, is positively correlated with rates (Bigne, Luis, & William, 2021).

A very popular pricing principle is demand-based pricing. As demand is low during specific periods, lower rates are offered. As demand increases, lower rate categories are closed, and higher rates are quoted (Forgacs, 2010). Today, however, demand is just one component of dynamic pricing approaches.

Bayoumi et al. developed a more sophisticated dynamic pricing model for hotels. Their proposed approach is based on price multipliers that vary around one and provide a discount or premium over seasonal reference prices. Bayoumi et al. determined these multipliers by applying an optimization algorithm to maximize revenues by considering the current demand and price sensitivity of hotel guests. According to Bayoumi et al., the price multipliers consider account influencing variables, such as hotel capacity and time until arrival (Bayoumi, Saleh, Atiya, & Aziz, 2013).

A novel framework, consisting of two different modules, to improve hotel revenue management is proposed by El Gayar et al. It aims to improve hotel revenue management by calculating forecasted demand arrivals and group reservations from real data. At first, a forecasting module estimates hotel arrivals by considering multiple parameters, such as reservations, cancellations, and duration of stay. The forecasting module simulates the actual process of reservations to get a forecast. This derived demand is used by an optimization model to generate improved recommendations for accepting reservations. El Gayar et al. showed that their proposed framework can generate effective recommendations to maximize revenue by applying their model to different sets of reservation records of simulated hotel data (El Gayar, Saleh, Atiya, & El-Shishiny, 2011).

Dynamic pricing models must be carefully designed by hospitality to avoid adverse reactions from customers. There is always the danger of price resistance and resentment from guests who booked their rooms at higher rates (Forgacs, 2010). Vives et al. suggest that revenue managers should consider the booking horizon duration in combination with the demand price sensitivity to maximize hotel revenues. The correct rate should be based on what the customer is able and willing to pay (Vices & Jacob, 2020).

### **Dynamic Pricing in Public Transportation**

The long-distance bus market has changed radically in Europe. For example, the service company FlixBus adopted a dynamic pricing strategy. FlixBus is a mobility provider that offers long-distance train and bus rides by providing low-cost transport services and an efficient and fast information system (Branda, Marozzo, & Talia, 2020).

Branda et al. described an approach called Data Analytics for Public Transport (DA4PT) for discovering the main factors influencing users' decisions in purchasing bus tickets. DA4PT aims to predict whether a user will buy a ticket and test pricing strategies for maximizing the number of purchased tickets and the total revenue of bus companies. Branda et al. used data from 3.23 million event logs of an Italian bus ticketing platform. The results revealed that factors such as occupancy rate, number of days passed from booking to departure, and ticket fare significantly influence travelers' buying decisions. The data from DA4PT can be used to forecast the number of purchased tickets with an accuracy of more than 90% and

low variance. Moreover, Branda et al. found that a dynamic pricing strategy can increase the number of tickets purchased by 6% and the total revenue by 9% compared to a standard pricing policy (Branda et al., 2020).

On the other hand, most cities have fixed pricing for mass transit. For example, passengers pay the same price for a ticket at 2 a.m. as at 8 a.m. or 2 p.m. The goal is to prevent rush hour crowds and better distribute passengers throughout the day. The goal is to balance flexibility and mobility. In other words, dynamic pricing should encourage mass transit and keep people safe (Santos, 2020).

Even though only a small number of transit operators implement a dynamic pricing approach today, the primary reason is that most transportation is tied to very complex hardware-based ticketing systems that do not have the flexibility to allow dynamic pricing. Software-based digital platforms are necessary to make dynamic pricing more common.

With software-based platforms, operators get information about the number of people booking seats and how many tickets have been sold. A software-based platform enables cross-reference data points with the capacity of the buses or other transportation mediums currently running to recommend a lower or more expensive price than one hour ago, depending on demand. Using artificial intelligence, the operator gets real-time data about the ridership patterns and uses that data for the dynamic pricing strategy (Santos, 2020).

Airlines apply dynamic pricing approaches as well (Phumchusri, 2013). Airline ticket prices change irregularly, regardless of whether purchasing them from the executing airlines or the secondary market. The goal is to maximize profits by balancing individual ticket pricing and the capacity of the plane (McAfee & Velde, 2007). Airline ticket prices constantly change based on current flight demand, the number of seats available, and the booking time (Shepard, 2019). Commonly, significant airline ticket prices change multiple times daily. For example, it is estimated that American Airlines has changed half a million daily prices per day. This estimated frequency of price changes seems especially large given that America transports around 50,000 passengers per day (McAfee et al., 2007). In general, airline tickets have a high coefficient of variation, meaning that the demand can fluctuate tremendously. Leisure market flights contain more fluctuating demands compared to commuter market flights. Consequently, the total order is challenging to predict (Shepard, 2019). Some research claims that the revenue-maximizing interest of airlines primarily drives dynamic pricing in airlines. However, McAfee et al. found that customer dynamics mainly involve dynamic price discrimination. By analyzing data on fares for 1,260 flights from American Airlines, Orbitz, and Travelocity, McAfee et al. found that dynamic pricing is not an attempt to extract more money from the consumer but rather an incentive to address incomplete markets (McAfee et al., 2007).

New internet tracking methods make these predictions more accessible and more accurate since airlines can track customer behaviors (Shepard, 2019). Since 2022, Lufthansa has used the market-leading provider PROS as its revenue Accelerator program's foundational technology. PROS will provide accurate forecasting and optimize for unprecedented visibility and continuous pricing across Lufthansa's operations. The goal is to maximize revenue across every flight, daily, and seat (Business Wire, 2022).

## **DYNAMIC PRICING FROM THE CONSUMER'S PERSPECTIVE**

Varying prices under different circumstances raises the question of whether dynamic ticket pricing is fair and ethical. Some research articles showed that consumers could perceive being mistreated under certain circumstances. For example, consumers may develop a negative impression of sellers if they notice they paid a higher price than other consumers (Charuvatana, 2019).

Charuvatana investigated the effects of known price differences on the customer's perception of price fairness. Significant price differences resulted in stronger unfairness perceptions compared to more minor price differences among the participants. Additionally, perceived price fairness positively influenced customer satisfaction. This fact proves that consumers compare the prices they pay to others for the same product or service. Third, Charuvatana showed that perceived price fairness positively influences repurchase intentions (Charuvatana, 2019).

Anderson et al. used a 28-month randomized field experiment with over 50,000 customers to investigate the reaction of customers if they buy a product and later recognize the same retailer sells the same product for a lower price. Anderson et al. found that customers react by making fewer subsequent purchases from the firm. However, the most concerning finding was that the effects are the largest among the firm's most valuable customers. In other words, those who purchased the product more frequently reacted negatively to less loyal customers (Anderson & Simester, 2010). Milman et al. analyzed the influences of different dynamic pricing strategies on consumer trust, consumer value, and brand loyalty in theme parks. An online experiment of six scenarios was designed to investigate those relationships. The results indicated that park visitors have the best positive attitudes and loyalty when they pay less and are aware that they spent less. When park visitors must pay premium prices, their reactions mostly did not change when they knew they paid more for charitable causes or sustainable practices (Milman & Tasci, 2021).

Price fairness perception may change if dynamic pricing is applied in the secondary market, for instance, by online travel agencies that offer hotel rooms for different prices. Alderighi et al. collected data from the online travel agency Booking.com and found that room rates change according to booking day, week of stay, and room type. Moreover, Alderighi et al. found that dynamic pricing negatively affected perceived price fairness. While customers tolerated changes during the booking period, differences in room rates among the weeks of stay and room types were perceived as unfair (Alderighi, Nava, Calabrese, Christille, & Salvemini, 2022).

Santos et al. examined the perceived price fairness of Uber by introducing a real-time dynamic pricing approach to match supply and demand for the service. Like the findings of Alderighi et al., the perception of price fairness depends on the context and evaluation of service benefits. Under certain conditions, dynamic pricing can trigger unfairness and negative emotions, especially when perceiving uncertainty and unpredictability of prices in the destination (Santos, Mayer, & Marques, 2019).

Additionally, Williams showed that dynamic pricing approaches could have welfare-reducing or welfare-increasing effects. If airline tickets are aggregated over markets, welfare is higher under dynamic pricing than uniform pricing. However, Williams showed that in markets where price adjustments primarily respond to a higher willingness to pay, welfare decreases under dynamic pricing (Williams, 2021). Chen et al. examined the impact of dynamic pricing on social welfare and consumer surplus. A dynamic pricing formulation designed to maximize welfare has the same structural properties as the revenue-maximizing policy. Chen et al. found that for systems with low capacity, revenue-maximizing active pricing policy and the market-clearing price are optimal for welfare (Chen & Gallego, 2018).

What can companies do to prevent unfair perceptions among customers and increase social welfare? One way can be through email and text alerts to inform people when surge pricing is in effect, so customers can use technology to get notifications about price increases and decreases (Irwin, 2017). Moreover, it is possible to create pricing structures that guarantee that consumers will not pay more than they would under traditional or static pricing (Irwin, 2017). Lastly, informing customers about the reasons may help them perceive price changes as more transparent and fairer. All three ways will increase social welfare since those actions will make dynamic pricing transparent, comparable, and accessible to all customers.



## REFERENCES

- Alderighi, M., Nava, C.R., Calabrese, M., Christille, J., & Salvemini, C.B. (2022). Consumer perception of price fairness and dynamic pricing: Evidence from Booking.com. *Journal of Business Research*, 145. <https://doi.org/10.1016/j.jbusres.2022.03.017>
- Anderson, E.T., & Simester, D.I. (2010). Price stickiness and customer antagonism. *The Quarterly Journal of Economics*, 125(2), 729–765.
- Aziz, H.A., Saleh, M., Rasmay, M.H., & ElShishiny, H. (2011). The dynamic room pricing model for hotel revenue management systems. *Egyptian Informatics Journal*, 12(3), 177–183.
- Bayoumi, A.E.M., Saleh, M., Atiya, A.F., & Aziz, H.A. (2013). Dynamic pricing for hotel revenue management using price multipliers. *Journal of Revenue and Pricing Management*, 12(3), 271–285.
- Bigne, E., Luis, J.L., & William, E. (2021). Advance booking across channels: The effects on dynamic pricing. *Tourism Management*. <https://doi.org/10.1016/j.tourman.2021.104341>
- Branda, F., Marozzo, F., & Talia, D. (2020). Ticket Sales Prediction and Dynamic Pricing Strategies in Public Transport. *Big Data and Cognitive Computing*, 4(4), 36.
- Charuvatana, V. (2019). Impacts of Dynamic Pricing on Customer Satisfaction and Behavioral Intentions in the Hotel Industry. *Dusit Thani College Journal*, 13(2), 16–32.
- Chen, N., & Gallego, G. (2018). Welfare Analysis of Dynamic Pricing. *Management Science*, 65(1). <https://doi.org/10.1287/mnsc.2017.2943>
- Choi, C., Jeong, M., & Mattila, A.S. (2014). A. Revenue management in the context of movie theaters: Is it fair? *Journal of Pricing and Revenue Management*, 14(2015), 72–83. <https://doi.org/10.1057/rpm.2014.30>
- Cuddihey, A. (2019). Dynamic Pricing Can Help Transport Charge Accurately for Services. *Metro Magazine*. Retrieved from <https://www.metro-magazine.com/10007197/dynamic-pricing-can-help-transport-charge-accurately-for-services>
- den Boer, A.D. (2013). *Dynamic Pricing and Learning: Historical Origins, Current Research, and New Directions*. Retrieved from <https://ris.utwente.nl/ws/portalfiles/portal/6470650/memo2025.pdf>
- Dutta, A. (2019). Capacity allocation of game tickets using dynamic pricing. *Data*, 4(4), 141.
- El Gayar, N., Saleh, M., Atiya, A., & El-Shishiny, H. (2011). An integrated framework for advanced hotel revenue management. *International Journal of Contemporary Hospitality Management*. <https://doi.org/10.1108/095961111111101689>
- Forgacs, G. (2010). Revenue Management: Dynamic Pricing. *Hospitalitynet*. Retrieved from <https://www.hospitalitynet.org/opinion/4045046.html>
- Healy, P. (2014). Ticket Pricing Puts ‘Lion King’ Atop Broadway’s Circle of Life. *The New York Times*. Retrieved from <https://www.nytimes.com/2014/03/17/theater/ticket-pricing-puts-lion-king-atop-broadways-circle-of-life.html>
- Hinterhuber, A. & Viberi, S. (2021). Pricing practices of football and basketball clubs in Italy. *Journal of Revenue and Pricing Management*.
- Irwin, N. (2017). Why Surge Prices Make Us So Mad: What Springsteen, Home Depot and a Nobel Winner Know. *The New York Times*. Retrieved from <https://www.nytimes.com/2017/10/14/upshot/why-surge-prices-make-us-so-mad-what-springsteen-home-depot-and-a-nobel-winner-know.html>
- Jelski, C. (2018). Disney version dynamic pricing. *Travel Weekly*. Retrieved from <https://www.travelweekly.com/Travel-News/Hotel-News/Disney-version-dynamic-pricing>
- Kemper, C., & Breuer, C. (2016). How efficient is dynamic pricing for sport events? Designing a dynamic pricing model for Bayern Munich. *International Journal of Sport Finance*, 11(1), 4–15.
- Kolbeinsson, A., Shukla, N., Gupta, A., Marla, L., & Yellepeddi, K. (2021). Galactic Air Improves Airline Ancillary Revenues with Dynamic Personalized Pricing. *Journal on Applied Analytics*.

- Malasevska, I., Haugom, E., Hinterhuber, A., Lien, G., & Mydland, Ø. (2020). Dynamic pricing assuming demand shifting: The alpine skiing industry. *Journal of Travel & Tourism Marketing*, 37(7), 785–803.
- McAfee, R.P., & Velde, V.L. (2007). *Dynamic pricing in the airline industry*.
- Morgan, R. (2018). Taylor Swift's concert revenue up 39 percent over last tour. *New York Post*. Retrieved from <https://nypost.com/2018/11/23/taylor-swifts-concert-revenue-up-39-percent-over-last-tour/>
- Phumchusri, N. (2013). Dynamic pricing in performance theater industry: An empirical study. In *IEEE International Conference on Industrial Engineering and Engineering Management*, pp. 1122–1126.
- Priester, A., Robbert, T., & Roth, S. (2020). A special price just for you: Effects of personalized dynamic pricing on consumer fairness perceptions. *Journal of Revenue and Pricing Management*.
- PROS Drives Revenue Acceleration Across the Lufthansa Group Airline Network. (2022). *Business Wire*. Retrieved from <https://www.businesswire.com/news/home/20220712005223/en/PROS-Drives-Revenue-Acceleration-Across-the-Lufthansa-Group-Airline-Network>
- Root, G.N., III. (2017). *The Disadvantages of an Everyday Low Pricing Strategy*. Small Business - Chron.Com. Retrieved November 21, 2021, from <https://smallbusiness.chron.com/disadvantages-everyday-low-pricing-strategy-23379.html>
- Sahin, M. (2018). Dynamic Pricing for Sports Events. *International Congress on New Horizons in Education and Social Sciences*. <https://doi.org/10.21733/ibad.473973>
- Sahin, M., & Erol, R. (2017). A dynamic ticket pricing approach for soccer games. *Axioms*, 6(4), 31.
- Santos, F.A., Mayer, V., & Marques, O.R.B. (2019). Dynamic pricing and price fairness perceptions: A study of the use of the Uber app in travels. *Turismo - Visão e Ação*. <https://doi.org/10.14210/rtva.v21n3.p239-264>
- Santos, P.F.D. (2020). City Transit: How To Balance Safety And Mobility With Dynamic Pricing. *Forbes*. Retrieved from <https://www.forbes.com/sites/forbesbusinesscouncil/2020/09/21/city-transit-how-to-balance-safety-and-mobility-with-dynamic-pricing/?sh=2ed9ef28241d>
- Shapiro, S.L., & Drayer, J. (2014). An examination of dynamic ticket pricing and secondary market price determinants in Major League Baseball. *Sport Management Review*, 17(2), 145–159.
- Shepard, K. (2019). The Algorithm behind Plane Ticket Prices and How to Get the Best Deal – USC Viterbi School of Engineering. *Illumin Magazine*. Retrieved August 15, 2022, from <https://illumin.usc.edu/the-algorithm-behind-plane-ticket-prices-and-how-to-get-the-best-deal/>
- Teymouri, A., Khataie, A., Andreev, P., & Kuziemy, C. (2017). Application of revenue management in supply chain of postal services. *IEEE International Conference on Industrial Engineering and Engineering Management*, pp. 1843–1847.
- Vives, A., & Jacob, M. (2020). Dynamic pricing for online hotel demand: The case of resort hotels in Majorca. *Journal of Vacation Marketing*, 26(2), 268–283.
- Williams, K.R. (2021). *The Welfare Effects of Dynamic Pricing: Evidence from Airline Markets*. National Bureau of Economic Research. Retrieved from <https://www.nber.org/papers/w28989>