Dynamic Pricing In U.S. Soccer Tournaments: A Business Analytics Perspective On Revenue Management

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ABSTRACT
This conceptual paper analyzes the use of dynamic pricing in soccer competitions in the United States, emphasizing the role of business analytics in enabling data-driven ticket pricing methods. Based on economic, marketing, and sports management perspectives, we identify a gap in the literature about dynamic pricing in soccer events, which have traditionally depended on static pricing models. Our research examines how dynamic ticket pricing might enhance income and attendance for soccer competitions while ensuring fairness for fans. Our research reveals that dynamic pricing enables organizers to maximize revenue from high-demand matches by increasing ticket prices to align with real-time market value and to enhance attendance for low-demand matches by strategically reducing prices and providing discounts. These modifications are facilitated by business analytics, encompassing demand forecasts and price optimization algorithms, which guarantee that current data informs pricing decisions on consumer willingness to pay. Our analysis emphasizes that dynamic pricing in sports functions not merely as a mechanism for price augmentation but may also augment consumer value and accessibility, as demonstrated by its capacity to lower ticket prices when warranted. Drawing on existing literature, the paper provides a theoretical framework and practical recommendations, highlighting areas for future empirical research. We offer practical insights into the implementation of dynamic pricing in soccer, emphasizing the significance of analytical models, effective stakeholder engagement, and policy considerations to balance revenue objectives with fan experience. These findings enhance sports management literature by applying dynamic pricing theory to U.S. soccer and providing a framework for utilizing business analytics in the optimization of sports revenue.

KEYWORDS: Dynamic Pricing, Ticket Revenue Management, Sports Business Analytics, Pricing Strategy, U.S. Soccer.

ABBREVIATIONS: MLB: Major League Baseball; MLS: Major League Soccer.

1. INTRODUCTION

Soccer tournaments in the United States represent a unique intersection of sports and business analytics; nonetheless, ticket pricing techniques in this domain are still under-examined. Although dynamic pricing, the practice of modifying ticket prices in real-time according to demand, has become prevalent in sports such as baseball and basketball [1,2], its use in soccer has been slower to develop. Conventional ticket pricing approaches in soccer, such as uniform pricing strategies, frequently undervalue high-demand matches, resulting in lost revenue that resellers exploit in secondary markets. MLB teams could have increased ticket income by approximately 2.8% by employing simple variable pricing to more accurately represent game-by-game demand [3]. This pricing inefficiency results in lost revenue for clubs and creates an imbalance, as certain supporters incur higher costs on resale platforms while others are unable to access affordable tickets. These challenges highlight a research gap: there is insufficient understanding of how dynamic pricing may be utilized to optimize revenues and attendance in U.S. soccer events, and how business analytics might aid in this transformation.

Although research from several sports indicates that dynamic pricing can substantially enhance profits and improve attendance, the literature about soccer matches is limited. Most previous research on sports ticket pricing concentrates on leagues such as MLB, predominantly from a management viewpoint, with few analytical models or case studies pertaining to soccer. A few international soccer clubs [4] have implemented dynamic pricing, yet in the context of U.S. soccer, such practices remain in an early stage. Consequently, key questions persist: How can dynamic pricing be efficiently executed for soccer competitions in the U.S., and what advantages and obstacles will it present for clubs and fans? Additionally, how can business analytics – including demand forecasting and real-time data analysis – be employed to guide and implement these dynamic pricing strategies?

This conceptual study utilizes economic, marketing, and sports management perspectives to investigate dynamic ticket pricing in U.S. soccer competitions. The sports sector demonstrates numerous characteristics that render dynamic pricing appealing, such as perishable inventory (seats that become valueless post-event), advance sales, variable demand, and the capacity to segment markets. Nonetheless, implementing these concepts in soccer events necessitates careful consideration of sport-specific elements (tournament frameworks, fan culture, competitive equilibrium) and the early phase of business analytics utilization in soccer organizations. Business analytics technologies, including predictive models and pricing algorithms, are essential to this analysis, since they provide the examination of extensive datasets (such as historical attendance, team performance, and opponent quality) and provide real-time optimal pricing recommendations.

It is important to clarify that this study is primarily conceptual and theoretical, designed to integrate existing research from economics, marketing, and sports management to develop a comprehensive theoretical framework for dynamic pricing in soccer tournaments. The paper does not employ primary data collection or empirical testing but rather leverages insights from secondary sources and literature to establish foundational recommendations and guide future empirical investigation. Given the identified research gap, the research questions (RQs) guiding this research are as follows:

RQ1: How can dynamic pricing strategies be designed and implemented in the context of soccer tournaments in the USA to improve revenue optimization and attendance outcomes?
RQ2: What role can business analytics play in the practical implementation of dynamic ticket pricing for these soccer events, and what data-driven approaches are most effective?
RQ3: How does dynamic pricing affect fans and consumer behavior in soccer tournaments? In particular, can it lead to price increases for high-demand matches and price reductions for low-demand matches, thereby balancing revenue goals with fan access?

This paper seeks to enhance both theoretical and practical understanding by examining these questions. Initially, it identifies a distinct research void by concentrating on dynamic pricing in U.S. soccer tournaments—an aspect predominantly neglected in sports pricing scholarship—thereby broadening the current theories of sports revenue management to a novel setting. Secondly, it offers a structure for incorporating business analytics into sports pricing strategies, demonstrating how data-driven models, such as demand forecasts and price optimization algorithms, can be implemented by soccer tournament organizers. Third, it provides insights into the dual effects of dynamic pricing on revenue and fan experience, highlighting that dynamic pricing serves as a mechanism for both revenue maximization and improved fan accessibility through deliberate price reductions. The study's findings and recommendations will assist sports economists, analytics professionals, and soccer administrators in utilizing dynamic pricing in tournaments, addressing a significant gap in both academic research and industry practice.

2. LITERATURE REVIEW

2.1. DYNAMIC PRICING

In many different businesses, dynamic pricing has become a fundamental revenue management strategy [5]. Pricing strategies that follow the dynamic pricing concepts have been discussed in the literature [6]. In order to reflect market-clearing values, they emphasize how demand-based pricing has been effectively standardized in industries where prices vary according to demand. They also discuss price optimization, explaining how statistical models are used to identify the best pricing points to maximize profit. These demonstrate how dynamic pricing has long been used in response to consumer behavior and market conditions. In the earlier days, the airline and hospitality industries were among the first to use data-driven pricing strategies [5,7]. Currently, dynamic pricing systems are being used in a variety of industries, such as ride sharing, e-commerce platforms, and live event ticketing, due to developments in technology.

From the traditional economic point of view, dynamic pricing's theoretical underpinnings are consistent with the traditional concepts of supply and demand. According to Kahneman *et al*. [8], customer responses are frequently more nuanced than straightforward price elasticity models would imply. Customers' perceptions of fairness can have a big impact on whether they think that price adjustments are opportunistic or appropriate. Therefore, even if dynamic pricing has its roots in sound economic theory, consumer psychology and confidence in the platform or company using it can determine whether it succeeds or fails.

For dynamic pricing to maximize revenue outcomes, accurate forecasting is essential, and the quality of variables such as demand, price sensitivity, and cancellation probabilities is directly related to the system's efficacy [9]. The interaction between algorithmic accuracy and human oversight is also noteworthy because human analysts can modify forecast inputs in response to market knowledge, which increases the flexibility of dynamic pricing systems. The success of contemporary dynamic pricing

applications in a variety of industries depends on these developments in forecasting and optimization. Businesses may accomplish this with more accuracy due to real-time data analytics, which incorporates data like social media and web traffic. Artificial intelligence and technological advancements will enable machine learning algorithms to streamline and improve these processes, enabling more precise price adjustments based on new inputs. However, the conflict between increasing profits and preserving consumer trust grows as these tools become increasingly automated. Although these concepts have their origins in the airline and hospitality industries, they are becoming more and more applicable to live sports and entertainment ticketing, where fan perceptions of fairness and value are important factors. The next section will examine the ways in which the larger cultural and community-driven landscape of sports ticketing interacts with these ideas of dynamic pricing and customer perceptions.

2.2. DYNAMIC PRICING IN SPORTS

In the sports industry, where ticket revenues are an essential component of overall financial health, the general idea of dynamic pricing has grown in importance [10]. They argue that the majority of sports pricing initially used a "one-size-fits-all" or seat location-based approach, in contrast to the airline and hospitality industries, where demand-based strategies have a longer historical precedent. Sport organizations are integrating advanced dynamic pricing algorithms, with the San Francisco Giants becoming the first to do so in 2009 [10]. These algorithms consider variables such as time, opponent, and individual performance factors [4,11,12]. The goal is to capture additional consumer surplus while managing the risk of unsold seats, aligning the sports sector more closely with strategies used in airlines and hotels. This section examines how dynamic pricing is implemented differently in North America and Europe, and concludes with a discussion of hybrid techniques that are increasingly impacting global tournaments.

2.3. NORTH AMERICAN ADOPTION

The San Francisco Giants were the first professional club to fully implement a dynamic pricing plan in 2009, and they saw a 7% boost in revenue in 2010 [12]. These strategies quickly expanded to other leagues, including the National Basketball Association and the National Hockey League. The purpose of using algorithms tuned to parameters such as time, opponent, and individual performance is to maximize revenue while avoiding alienating fan bases [10].

At the same time, MLS in the United States has begun to use dynamic pricing, particularly after high-profile signings. Clubs establish initial price floors but enable prices to rise substantially in response to increased demand, particularly when high-profile players attract attention. Although the theoretical underpinnings remain related to standard supply and demand, the practical subtleties concern guaranteeing affordability and maintaining strong attendance figures in a league that continues to seek constant national popularity [13]. Some clubs include business analytics into their dynamic pricing strategy, and some do not automate decision-making processes [14]. With improvements in artificial intelligence and technology, real-time data analytics and automated decision making are likely to be widely used; nevertheless, human oversight is still required in some areas.

Lionel Messi's transfer to Inter Miami CF in 2023 demonstrates the importance of high-profile signings and global attention in driving ticket prices. Even in the MLS, which was used to dynamic pricing prior to Messi's arrival, the rush in demand highlighted how quickly algorithms can drive up ticket prices, often pushing match tickets into the hundreds or even thousands of dollars for average seats. While the short-term economic benefits were considerable, early media criticism raised worries about pricing off traditional supporters, posing implications for MLS fan culture [6].

2.4. EUROPEAN CONTEXT

In Europe, dynamic pricing adoption in sports has been noticeably slower than in North America. One major factor is structural and cultural differences between the two regions. In Switzerland, for example, sports organizations frequently use fixed price systems, especially in high-demand industries like ice hockey. This hesitance is partly due to a lack of digitalization and data-driven decision-making among teams, as well as fan resistance to perceived unfairness in pricing [15].

European soccer clubs, such as Bayern Munich, continue to adopt a basic pricing methods that categorize games based on opponent quality [4,16]. The barriers to implementing dynamic pricing in Europe are varied. Swiss sports clubs, for example, confront obstacles in deploying the modern technologies required for this pricing plan. Many clubs lack adequate data collecting methods, which are critical for projecting demand and determining ideal pricing [15]. Cultural considerations also have an important impact. European fans, particularly in sports, prioritize fairness and community over revenue growth. Dynamic pricing is said to undercut these principles by causing dissatisfaction among fans who pay different prices for the same game. This differs from the United States, where dynamic pricing is commonplace and seen as a market-driven method rather than discriminatory [16].

However, in Spain's top-tier soccer league, dynamic pricing has been implemented. Dynamic ticket pricing aligns ticket costs with fan preferences and match characteristics. The quality of the opposing teams, stadium facilities, game time and day, and fan attendance rates are all important factors in determining ticket costs. The model demonstrates that fans place a higher value on games featuring top-tier teams, superior stadium infrastructure, and games scheduled at typical times such as weekends and evenings. These factors can result in price variances of up to 300% amongst clubs [17].

These findings demonstrate the potential for dynamic pricing to strike a compromise between fan satisfaction and revenue optimization. Overcoming cultural barriers to dynamic pricing in Europe would necessitate transparency and a focus on proving the benefits of such systems, such as fairer access to in-demand games and better match-day experiences for fans.

2.5. GLOBAL TOURNAMENT

As soccer's globalization accelerates, major competitions emerge as testing grounds for increasingly flexible dynamic pricing structures. In the run-up to the 2026 FIFA World Cup, which will be co-hosted by the United States, Canada, and Mexico, the FIFA Club World Cup, which will debut in an expanded format in the United States in 2025, will use dynamic pricing [18]. The experience with dynamic pricing in North American leagues—exemplified by the MLS and the current "Messi Effect"—indicates that major tournaments will see substantial fluctuations in prices in reaction to rising international demand.

If the pricing algorithms are completely unregulated, significant price increases might promote a sense of exclusivity or "touristification," marginalizing traditional fans and potentially weakening the impassioned atmospheres that characterize important soccer matches. Ultimately, the convergence of dynamic pricing, cultural factors, and global events poses fundamental issues of fairness and access in modern soccer. As star players ' moves (like Messi's) drive new surges in market demand, event organizers are under increasing pressure to balance profit maximization with the sport's social ethos [19]. These issues—fairness, profit maximization, and the commodification of marquee events—will be addressed in the following section, which examines the effects of dynamic pricing on fan culture and regulatory responses.

3. THEORETICAL AND CONCEPTUAL FOUNDATIONS

To thoroughly examine dynamic pricing in sports, it is essential to base the discourse on relevant theories from economics, marketing, and sports management. These theories explain the effectiveness of dynamic pricing, consumer responses, and the additional elements practitioners must contemplate beyond mere revenue. The subsequent subsections define essential perspectives: (a) economic principles of pricing and revenue management, (b) marketing frameworks of value-based pricing and consumer willingness-to-pay, (c) sports management viewpoints on fan loyalty and equity, and (d) business analytics perspectives.

3.1. ECONOMIC PERSPECTIVES: PRICE ELASTICITY AND REVENUE MANAGEMENT

Dynamic pricing fundamentally applies microeconomic theory, particularly the principles of demand elasticity and revenue optimization for perishable commodities. Price elasticity of demand quantifies the responsiveness of the quantity demanded to variations in price. In the majority of empirical investigations regarding sports attendance, demand has been determined to be somewhat price-inelastic within the standard pricing range [20]. A percentage rise in ticket price generally results in a lesser percentage loss in ticket sales, at least to a certain extent. For a profit-maximizing monopolist, such as a sports team during home games, the theoretical optimum occurs at the point where demand is unit elastic.

However, teams have historically focused on the inelastic segment intentionally for strategic purposes. Dynamic pricing offers a method to assess and use elasticity with greater precision: prices can be steadily increased until the threshold is reached where additional hikes would adversely impact attendance and revenue disproportionately. In high-demand sports (derbies, finals), demand may remain inelastic even at elevated price points, indicating considerable revenue potential through increased pricing. Conversely, for low-demand games, demand may become elastic even at reduced rates, suggesting that price reductions or promotions could enhance attendance sufficiently to augment overall income or fulfill alternative objectives, such as fan growth. The economic principle of price discrimination is pertinent in this context.

Dynamic pricing constitutes a variant of intertemporal price discrimination, wherein disparate prices are levied at various periods for distinct buyer categories according to their willingness to pay. Initial purchasers may benefit from reduced pricing, incentivizing early commitment or catering to price-sensitive consumers, but last-minute buyers, typically less price-sensitive or eager to attend, may incur a surcharge. Sports events meet the economic standards for efficient revenue management: the product (a ticket at a game) is perishable (it holds no value after the game commences, as unsold seats cannot yield money thereafter), capacity is limited, and the product is generally sold in advance. Kimes's fundamental criteria for yield management—comprising segmentable markets, perishable inventory, advance sales, minimal marginal sales costs, substantial fixed expenditures, and variable yet predictable demand patterns—are all pertinent to sports tickets [2,21,22].

The secondary market exemplifies a failure in yield management: when teams establish a singular low price, any additional willingness to pay is appropriated by resellers, who implement dynamic pricing through auctions or market pricing. From an economic standpoint, it is more effective for the original seller (team or organizer) to harness this value through dynamic pricing, ensuring that money is directed to the event organizers (who invest in the product) instead of arbitrageurs. Theoretical models, along with certain empirical evidence, indicate that the implementation of dynamic pricing by teams can result in a bigger overall surplus, comprising both team revenue and consumer surplus, or at least a more equitable allocation of it [2].

3.2. MARKETING PERSPECTIVES: VALUE-BASED PRICING AND WILLINGNESS-TO-PAY

From a marketing perspective, pricing transcends just revenue; it involves matching price with customer value and managing customer relationships. Value-based pricing is a principle asserting that prices should correspond to the value a consumer attributes to the product, rather than merely the seller's cost plus a profit margin. Sporting events possess significant intangible value for fans, encompassing excitement, loyalty, and memories, which can differ markedly among consumer categories and circumstances. Dynamic pricing is fundamentally an endeavor to implement value-based pricing instantaneously: as an increasing number of customers indicate high value through robust demand, the price escalates to correspond with that aggregate willingness to pay. Marketing science frequently uses willingness-to-pay models to ascertain effective pricing strategies.

In sports, it can be assumed that each fan possesses a maximum willingness to pay for a specific match. Dynamic pricing algorithms seek to assess the distribution of willingness to pay and maximize the area beneath that curve, so transforming consumer excess into augmented income. The most devoted fans or those who want a unique experience, such as a World Cup final, may exhibit an exceptionally high willingness to pay. Nevertheless, marketing emphasizes the significance of customer satisfaction and long-term relationships. Research on fairness developed the concept of dual entitlement: consumers perceive that corporations are entitled to a just profit, while consumers are entitled to a fair price [8]. Suppose a corporation increases prices merely due to excessive demand, without any corresponding rise in costs or added value. In that case, consumers may perceive this as a breach of their entitlement to a fair price. In sports, a fan may recognize that a finals ticket ought to be more costly than a group match (value disparity); nevertheless, if the price doubles throughout the purchasing process, it may evoke a sense of injustice. Ultimately, marketing theory emphasizes that price strategy should augment, rather than undermine, the customer connection.

3.3. SPORTS MANAGEMENT PERSPECTIVES: FAN LOYALTY AND FAIRNESS PERCEPTIONS

Sports are not just another entertainment product – they involve deep emotional connections, community identity, and a sense of loyalty that fans have toward teams. These factors make the management of pricing particularly sensitive. Fan loyalty in sports refers to fans' psychological commitment and allegiance to a team, often built over years of support. Loyal fans exhibit behaviors like attending many games, buying merchandise, and emotionally investing in the team's outcomes. Importantly, loyal fans often have higher tolerance for inconveniences or price increases because their attachment is strong [23].

Organizational justice encompasses both procedural justice, which pertains to the fairness of the process, and distributive justice, which concerns the fairness of the outcome; all are equally significant. If the process of establishing and modifying prices is perceived as equitable, open, and thoughtfully executed, consumers are more inclined to accept a slight increase in costs. For instance, a club may engage fan representatives or articulate the rationale for price adjustments. Offering this context might position dynamic pricing as advantageous for the fan community in the long term rather than only as a means of revenue extraction.

In essence, the sports management perspective prioritizes fan-centric metrics: loyalty, trust, equity, and community impact. It functions as an essential counterweight to the exclusively economic perspective. Shapiro *et al*. [24] contended that unregulated dynamic pricing, disregarding justice, can undermine the fan loyalty essential to clubs. A well-executed dynamic pricing strategy perceived as equitable by fans can increase revenues while preserving or even augmenting loyalty; for example, if fans believe the team is just by reducing certain prices and charging wealthier fans more for premium games, this may be regarded as a rational method. The theoretical frameworks established—economics for revenue and efficiency, marketing for value and customer behavior, and sports management for loyalty and fairness—will inform the subsequent discussion. By considering these perspectives, we can comprehensively analyze dynamic pricing in relation to forthcoming global soccer events, ensuring that our analysis and recommendations encompass not only the financial aspects of pricing but also the methodologies and target audiences that influence the efficacy and sustainability of such strategies.

3.4. BUSINESS ANALYTICS PERSPECTIVES: PREDICTIVE INTELLIGENCE AND REAL-TIME OPTIMIZATION

Recent developments in business analytics have impacted dynamic pricing in sports by incorporating predictive intelligence into pricing strategies. Sport organizations are increasingly using data-driven models to predict demand and understand customer

behavior, instead of static pricing decisions [25,26]. These predictive analytics utilize a lot of different information, like past ticket sales and team performance, as well as information about the opponent, the time and date of the game, and even outside factors like the weather forecast to estimate fans' willingness to pay under various conditions. By drawing conclusions from such data, teams can predict how demand will change as the event gets closer and identify optimal price points for different segments. Implementing these optimization techniques has been shown to yield significant revenue gains. For example, data-driven pricing models in sports could increase revenue by about 7 to 12% [25].

4. DISCUSSION AND ANALYSIS

Our analysis indicates that dynamic pricing offers significant potential for soccer events in the USA, although its application must be customized to the sport's unique environment, unlike sports such as baseball, which offer extensive seating and a prolonged season for ample pricing data, soccer tournaments, whether short-duration events or knockout competitions, exhibit distinct demand patterns. Nonetheless, the fundamental idea persists: modifying ticket pricing according to real-time demand can substantially enhance financial results and attendance for soccer games. Previous studies in many sports establish a robust basis; for instance, the implementation of dynamic pricing by MLB's San Francisco Giants [12]. Economists have long observed that static pricing frequently results in lost revenue; with fixed prices, popular sports sell out at rates lower than what many fans would be prepared to pay, while less appealing games typically have unsold seats. Dynamic pricing directly mitigates this inefficiency. It enables organizers to secure more willingness-to-pay for popular matches and, equally crucial, to enhance demand for less desirable matches by reducing rates. This dual feature is essential for soccer tournaments, as matchups can differ significantly in attractiveness — a final match or a rivalry game may justify a premium, while an early-round game with lesser-known clubs may necessitate a discount to draw neutral spectators.

An effective dynamic pricing strategy for soccer depends on comprehensive business analytics to predict demand and adjust prices accordingly. Predictive analytics serves as the foundation of this methodology; teams are required to examine historical data, performance indicators, tournament significance, weather predictions, and social media trends to assess the anticipated demand for each match. Previous research (for example, [27]) has highlighted that dynamic pricing methods necessitate demand information as an input. Advanced algorithms, potentially utilizing machine learning or statistical methods, can transform these demand projections into ideal pricing suggestions, adjusting them as new information, such as recent victories or defeats, star player injuries, and ticket sales momentum, emerges. In reality, this implies that a club or tournament organizer may revise ticket prices on a daily or weekly basis in the lead-up to a match. Modern analytics software and ticketing systems render such modifications practicable; for instance, dedicated platforms have been created to analyze sales data and external variables, enabling the issuance of thousands of price adjustments within minutes, seamlessly integrating with online ticket marketplaces. Business analytics professionals are essential in applying these technologies; they develop pricing algorithms and dashboards that enable decision-makers to visualize fluctuations in demand. They also guarantee that models are calibrated to prevent erratic fluctuations, specifically by implementing reasonable limitations to ensure that prices do not fluctuate excessively, hence avoiding confusion or alienation of fans.

The primary objective of dynamic pricing in soccer competitions is to maximize income and attendance by adjusting ticket prices to match consumer willingness to pay at any certain time. Data from both simulations and empirical instances demonstrate significant advantages. Dynamic pricing consistently surpasses static pricing in terms of revenue. A simulation study focused on soccer revealed revenue increases of approximately 9% with a dynamic pricing model compared to a static approach [2]. The profits arise from capitalizing on the popularity of significant matches: when a tournament's semifinal or final garners substantial interest, dynamic algorithms increase pricing to correspond with the increased demand, so that the event organizer, rather than secondary market resellers, receives the primary financial benefit. Simultaneously, dynamic pricing can enhance attendance for less favored matches. The marginal cost of admitting an additional spectator is low, and each extra fan can produce supplementary money from concessions and sales; thus, teams are highly motivated to occupy vacant seats. Dynamic pricing offers the adaptability to lower costs during periods of low demand, rendering tickets more accessible to price-sensitive demographics, including families and casual fans. This element directly addresses our third research question: Dynamic pricing is not solely a mechanism for price inflation; it also serves as a means to provide discounts and promotions. The behavior of secondary ticket vendors exemplifies this notion effectively; as the match day closer, if tickets are still unsold, prices in the secondary market typically decline substantially [28]. A primary seller (the tournament organizer) might replicate this by strategically reducing ticket costs for under-attended matches or as the event date approaches, so enticing last-minute purchasers who might otherwise remain at home. Strategic price reductions can enhance the ambiance and audience interaction at the venue without compromising total revenue objectives, as those seats may have remained unsold at the initial price level. Implementing dynamic pricing in soccer competitions must also account for fan equity and the perceived value of the experience. A prevalent concern is that early purchasers may perceive a disadvantage if prices subsequently decline, while late purchasers may feel excluded if prices escalate excessively. The adoption of a pricing plan that escalates as the match date nears provides

incentive for early purchases by fans. This strategy ensures that the initial announced price is the lowest, mitigating the danger of subsequent price reductions that may frustrate early buyers. A more dynamic methodology establishes a minimum price (often the season ticket holder rate or an initial early-bird price) and subsequently permits prices to fluctuate within defined limits. This approach guarantees buyers will not exceed a predetermined cap when purchasing early, while also providing the opportunity to discover discounts if a game's demand diminishes. From an analytical standpoint, establishing these floor and ceiling prices is a component of the pricing optimization dilemma, frequently guided by willingness-to-pay research. Research shows that static prices were significantly lower than what numerous fans would have been willing to pay, indicating a potential revenue gain [29,30]. An accurately calibrated dynamic pricing model could increase prices closer to the actual market value for major games without discouraging attendance, provided that this is apparent to customers.

When implementing dynamic pricing for soccer competitions, organizers must adopt a comprehensive strategy that balances revenue maximization with fan satisfaction and long-term loyalty. This implies that communication and transparency are as crucial as the price mechanism. Fans should be apprised that ticket prices may fluctuate over time due to demand, and communications can accentuate the favorable aspect or announcing promotional reductions for forthcoming lesser-known matches to generate interest. From a policy perspective, tournament organizers and regulatory entities such as U.S. Soccer or MLS may establish protocols or best practices for dynamic pricing. These may encompass safeguarding season ticket holders (ensuring package value remains stable despite fluctuations in individual game pricing), establishing maximum rise rates to avert price gouging, and employing data responsibly (e.g., refraining from exploiting personal data beyond demand trends). Business analytics can assess the effects of dynamic pricing in real time and after the tournament. Key performance indicators would encompass total income compared to budget, attendance figures in relation to capacity, and maybe metrics of fan mood, such as the number of complaints or social media sentiment concerning pricing. Through the analysis of these metrics, organizers can enhance their pricing models progressively. Suppose data indicates that an excessive price increase for a certain semi-final match resulted in decreased attendance. In that case, the algorithm can be modified to adopt a more conservative approach in analogous future situations. Conversely, suppose a group-stage match involving underdog teams experienced a late influx of interest that resulted in a sellout at reduced rates. In that case, the model may learn to predict increased late-stage demand for underdog teams and adjust the price decline accordingly. Dynamic pricing for soccer tournaments should be an iterative, data-informed approach that perpetually learns from each match and tournament to enhance the equilibrium between revenue maximization and maintaining accessibility and excitement for fans.

5. CONCLUSION AND RECOMMENDATIONS

5.1. CONCLUSION

In conclusion, dynamic ticket pricing, underpinned by comprehensive business analytics, signifies a progressive strategy for soccer tournaments in the USA to improve their financial viability and fan engagement. This study has emphasized that despite the challenges, including technological demands and controlling fan perceptions, the advantages of dynamic pricing are substantial. It connects pricing with actual market demand, maximizes revenue during peak periods, and employs price flexibility to keep stadiums lively even during lower-demand games. In a sport like soccer, which is experiencing growth in the United States despite competition from other prominent leagues, such innovative commercial strategies can offer a competitive advantage. The suggestions provided below work as a guide for professionals to execute dynamic pricing judiciously. Subsequent studies may expand upon these findings by investigating case studies of dynamic pricing implementations in soccer, assessing long-term impacts on attendance trends and fan loyalty, and enhancing analytical models tailored to the intricacies of tournament frameworks. The integration of dynamic pricing and soccer analytics illustrates how sports organizations may utilize data-driven tactics to attain mutually beneficial results, financially successful events, and engaging experiences for fans.

5.2. RECOMMENDATIONS

An essential insight from the business analytics perspective is that successful dynamic pricing requires a strong foundation of data-driven forecasting. Therefore, before adopting dynamic pricing, tournament organizers must evaluate their current data infrastructure and determine whether their ticketing systems can support algorithmic adjustments and demand monitoring. Practitioners should also prioritize hiring or training personnel who can interpret predictive models, ensuring that human oversight complements automated pricing tools. Aligning these analytics capabilities with operational strategy is a prerequisite to realizing the financial and attendance benefits discussed throughout this paper. Based on that, we recommend some best practices for introducing dynamic pricing in soccer events.

Allocate resources to enhance business analytics capabilities. Soccer organizations should establish robust analytical teams to manage the data collecting and modeling necessary for dynamic pricing. This entails utilizing previous ticket sales, team performance metrics, and market variables to construct dependable demand estimates. Precise forecasting is fundamental

to effective dynamic pricing; it averts overestimation that may result in unoccupied seats and underestimate that allows revenue to remain unexploited.

Establish explicit guidelines prior to implementing dynamic pricing. For instance, set a minimum price equivalent to the season ticket holder rate or an early-bird price to guarantee that loyal fans consistently receive the most advantageous offer. Establish a justifiable limit for price increases, potentially linked to a percentage above the nominal value, to mitigate perceptions of price gouging. A balanced strategy incorporating both increases and decreases within defined limitations may be more suitable for the U.S. market.

Implementing dynamic pricing gradually can assist in managing fan responses. A team may initiate dynamic pricing for a select group of games or only for specific seating sections. During this point, inform fans through advertisements explaining the reasons for potential price fluctuations. Highlight that dynamic pricing aligns ticket prices with demand and can provide discounts for events that would often see poor attendance. Emphasize success narratives, such as instances where a price reduction results in increased attendance at a less significant match. As fans acclimate to the notion over time, resistance is expected to wane, allowing for the expansion of dynamic pricing.

Dynamic pricing is not a static technique. It necessitates ongoing oversight, despite the presence of automated technologies. Tournament organizers must monitor sales momentum and external influences, such as an unforeseen team progression to subsequent rounds or an injury to a prominent player, and be prepared to take action if necessary. For instance, if an automatic model increases prices yet sales abruptly decline, managers may opt to manually modify prices or implement a temporary promotion to stimulate demand. Conversely, suppose an underappreciated match begins to sell out owing to a surge in interest (for instance, an underdog team advancing significantly). In that case, managers should ensure that prices are adjusted accordingly to avoid forfeiting potential money. Post-event analysis is crucial: following the competition, evaluate what was effective and what was not. This data will enhance forthcoming pricing models and initiatives.

Ultimately, consistently align the dynamic pricing strategy with the overarching objective of improving the fan experience. The ambiance at soccer competitions is generated by vibrant, enthusiastic crowds—an outcome that dynamic pricing might facilitate by appealing to price-sensitive fans to occupy the vacancies. Teams should consider reallocating a fraction of the additional revenue produced by dynamic pricing towards enhancements in fan experience (better facilities, promotions, and fan interaction activities on match day), thereby establishing a positive feedback loop. When fans observe concrete enhancements and recognize that intelligent pricing is facilitating these advancements, they are more inclined to endorse such pricing tactics over time.

AUTHORS' CONTRIBUTIONS

Both authors contributed equally to this study.

CONFLICT OF INTERESTS

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