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Dynamic Pricing in Major League Baseball Tickets: Issues and Challenges

John T. Drea
Illinois College, john.drea@mail.ic.edu

Andrew Nahlik
Illinois College, andrew.nahlik@mail.ic.edu

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John T. Drea, Illinois College

Andrew Nahlik, Illinois College

John.drea@mail.ic.edu

Abstract – With its origins in the airline industry, dynamic pricing has recently been extended to the area of Major League Baseball tickets in both the primary and secondary markets. The present study examines similarities in the application of dynamic pricing in the airline and MLB industries, as well as the key differences, which include the interactive effects of competitors in the airline industries and the presence of a secondary ticket market for MLB tickets. The "zone of reasonableness" concept used in freight pricing provides a useful framework for understanding the self-imposed upper and lower price limits for MLB primary market ticket pricing in primary markets.

Keywords – Sports marketing, dynamic pricing, baseball, airlines

Relevance to Marketing Educators, Researchers, and/or Practitioners –The goal of dynamic pricing is to maximize the revenue from a product/service by adjusting prices in accordance with demand and available inventory. In both the airline and MLB industries, dynamic pricing increases ticket revenue by raising prices as inventory decreases and demand increases. For marketing educators teaching pricing concepts, the paper compares how dynamic pricing is applied in MLB and airline ticket sales and allows readers to see the effects that competitors, capacity, and secondary markets can have on prices.

Introduction

A rapidly growing trend in the business of professional sports is the use of dynamic pricing as a tool for maximizing revenue generation. Dynamic pricing (DP) is defined as a system in which prices respond to supply and demand pressures in a real time (or nearly real time) manner (Sahay, 2007). American Airlines is credited with the first widespread use of DP as a pricing tool to handle the mismatches in supply and

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demand for certain flights (McAfee and te Velde, 2006). DP has spread to numerous other industries, including entertainment, hotels, manufacturing to order, and lately, to Major League Baseball.

Conceptually, dynamic pricing can be understood as on a per unit basis as:

$$Price = Transaction\ Cost + Marginal\ Cost + Markup$$

where the markup is assigned according to what the market will bear, with the lowest acceptable price being the sum of a transaction cost plus the marginal cost of generating a unit for sale.

The goal of a DP model is typically one of profit maximization; however, the implementation of a profit maximization strategy is complex. In the airline industry, maximizing the revenue for a single flight by filling every seat through discounting likely means that later flights to the same destination will be difficult to maximize. In addition, competing carriers in the same segment will likely react to price changes with their own pricing changes, creating a very dynamic marketplace.

DP is typically most effective when two product characteristics are present (McAfee and te Velde, 2006).

1. The product/service has a specific expiration date, at which point the value for the product service becomes zero, such as a hotel room, an airline flight, an event ticket, or a time-dated ("sell before") product. This creates a pressure on the seller to liquidate inventory as the expiration date approaches, which potentially creates a downward pressure on prices. This is particularly true when supply exceeds demand.
2. Second, the capacity for the product/service is fixed and can only be increased at a relatively high marginal cost. This characteristic creates the opposite effect of upward pressure on pricing, especially when demand exceeds supply.

Rascher et al (2007) posited that MLB teams were failing to capture millions of dollars of revenue by not using dynamic pricing, thereby allowing the secondary market to exploit the demand for certain high demand games. Three years later, the San Francisco Giants were credited with implementing the first dynamic pricing system in Major League Baseball (Young, 2010). Since this introduction in 2010, it is estimated2 that twenty-eight of thirty MLB teams (primary market) are dynamically pricing some tickets for the 2015 season. The secondary market for MLB tickets is largely dominated by StubHub, which enables buyers (both individual ticket holders and ticket brokers who purchase blocks of tickets for re-sale) who wish to sell

[2] Private discussion with a MLB team official, April 2015.

tickets to price their tickets dynamically. This rapid adoption of DP in the MLB primary market is based upon the belief that the use of DP generates increased revenues.

DP has spread rapidly across Major League Baseball, and one of the questions that remains unanswered in the existing literature is how DP in Major League Baseball is different from DP as it was originally developed in the airline industry. The goal of this paper is to examine these similarities and differences and to examine the issues surrounding the use of dynamic pricing within Major League Baseball.

Price Dispersion, Product Expiration, and Capacity

Models of dynamic pricing suggest that prices should rise after tickets initially go on sale, then fall as the event approaches in order to maximize revenue. McAfee and te Velde (2006) found this to be partially correct in their study of DP in the airline industry – ticket prices rose an average of $28.20 two weeks before take-off, and then rose another $50 in the week before takeoff. Rather than decline immediately before departure, airline ticket prices actually rose another $16 the night before take-off. This data was effectively confirmed in a 2011 study by Airlines Reporting Corporation, which found that prices are 40% above average if purchased the day of travel but were 6% below average if purchased six weeks prior to departure (Sakraida, 2012). Escobari (2012) also found that airline prices for a 100 passenger aircraft increase an average of $1.53 for each less seat that remains available, and that price increases accelerate during the final two weeks due to a combination of reduced capacity and price inelasticity among business travelers.

One of the reasons airline ticket prices generally do not fall as the event horizon approaches is the desire for airlines to price discriminate between different types of customers. In effect, an airline using DP can charge more to customers that are willing to pay more for a last minute ticket (Sweeting, 2012). The lack of a drop in pricing at the end to maximize revenues is likely a function of not having a pool of travelers waiting for a potential price reduction (people need a reason to travel), and an airline not wanting to inadvertently reward travelers who wait until the last minute to book a ticket.

StubHub and Ebay are examples of a platform for dynamic pricing in the entertainment industry, where prices can fall as an event becomes closer and event supply exceeds demand. These declines accelerate as the event comes closer and frequently range in the 30-60% discount from the original ticket price (Sweeting, 2012).

Consumer Decision Making and Dynamic Pricing

Consumer decision making processes are an important consideration in creating a DP model. Many DP models are based upon deterministic decision models; that is, there is little uncertainty in demand and purchase decisions are predominantly a function of pricing decisions. (An options market for a commodity would be an example.) Such classic approaches to DP assume that consumers make purchase decisions when the price of the item to be purchased drops below the value assigned to it (for example, when an airline ticket that is valued at $300 drops below $300 in price, the consumer purchases the ticket.) This viewpoint has correctly been described as myopic (Levin, McGill, and Nediak, 2010). The reality for MLB tickets, airline tickets, hotel reservations, etc. is that such product markets are fundamentally stochastic and influenced by a combination of deliberate actions (pricing, promotion, etc.), random events, and events beyond the control of the seller (winning percentage, weather conditions, etc.). As an example, regression modeling of minor league baseball games has shown that even with the independent variables of winning percentage, weather, day of the week, and presence/absence of promotions, nearly half of all variation in ticket sales remained unaccounted (Drea, 1991).

In reality, consumers are likely to be strategic in their behavior by learning how certain perishable items are priced in a DP environment (Talluri and van Ryzin, 2004). As the level of involvement with a dynamically priced item increases, it becomes increasingly likely that consumers move away from a deterministic DP model (purchase occurs when value exceeds price) and become more strategic. Consumers are likely to communicate with other consumers regarding high involvement purchases, becoming more sophisticated and strategic in their decision making to find a price position that maximizes their return (the difference between price and value assigned). This implies that to maximize revenue from consumers, the process by which dynamic prices are set should not be completely transparent to consumers. The pricing systems within most major airlines are "remarkably opaque to the consumer, which is not surprising given one estimate that American Airlines changes half a million prices per day" (McAfee and te Velde, 2006). If the time of the lowest price point can be readily estimated by a consumer and if the consumer is effectively rewarded for waiting with a lower price, the marginal revenue from each ticket will decrease as consumers optimize their return by timing their purchases.

Dynamic pricing has its criticisms, which focus on two issues: negative influences on consumer search behavior, and issues of price fairness. DP complicates search processes for consumers, who must weigh whether to purchase a ticket early or to delay a purchase to see if prices fall without knowing how the dynamic model works (Furtwengler, 2011). Consumer perceptions of the "fairness" of dynamically set prices is a function of the magnitude of the price increase, the extent to which the customer is loyal, and the temporal proximity of the price difference (Dai, 2010). Consumers are likely to describe dynamically set prices as unfair when the difference is to their disadvantage (Bolton, Warlop, and Alba, 2003). Loyal customers were found to have

reduced perceptions of price unfairness (than non-loyal customers) when a price change was small or temporally distant; however, when the price change was large and/or recent the perceptions of price unfairness were greater (Dai, 2010).

Dynamic Pricing in the Airline and MLB Industries

Extending DP from the airline industry to MLB tickets requires an understanding of how the two industries are similar and different as it applies to pricing. Clearly, some similarities exist:

1. Both airline and MLB tickets are sold in advance, and unsold tickets expire at departure/game time (perishable).
2. Capacity is set in advance and can only be modified at a significant marginal cost.
3. There is considerable uncertainty about aggregate demand than cannot be resolved solely through pricing.
4. Consumers operate with imperfect information, but improve their decision making over time in response to learning (primary vs. secondary markets, purchase timing.)

There are numerous differences between the airline industry and MLB regarding the influences for dynamic pricing, as shown in Table 1. Airline ticket pricing features several factors which contribute to highly complex DP models. These include the presence of direct competitors within the airline industry and the interactive effect that changes in process have on competitor prices (and vice versa). While MLB teams have direct competitors, a consumer is less likely to purchase a ticket for a game from a competing team in order to obtain a lower price.

One of the key differences between the use of DP in the airline industry and MLB ticketing surrounds the potential for negative repercussions for perceived price unfairness. Because airline ticket prices tend to move and down collectively as an industry, individual airlines are unlikely to be perceived as exhibiting price unfairness for fluctuating prices since ticket prices for competitors are likely to be fluctuating as well. (The exception would be tickets purchased within hours of departure when only one competitor has available capacity.)

Table 1: Dynamic Pricing Influences: Differences between Airline Tickets and MLB Tickets

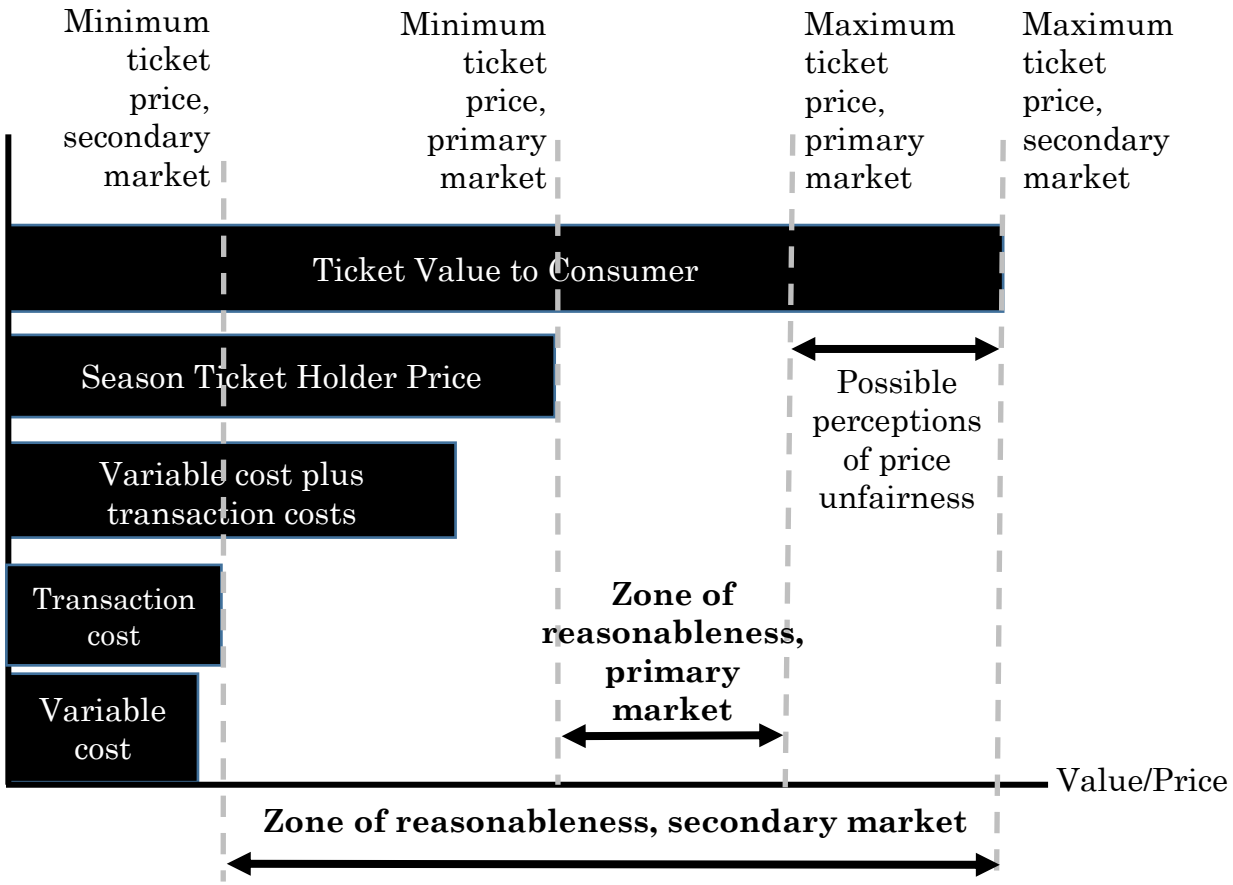
	Airlines	Major League Baseball
Competitors	Multiple direct competitors in geographic proximity are a direct influence on prices.	Direct competitors have limited influence on prices, and are seldom in geographic proximity. Generic or total budget competitors are a greater influence.
Secondary Markets	No secondary market	Active secondary market (StubHub)
Product Differentiation	Low. Product is viewed to some extent as a commodity, differentiated on price, services, and convenience	High. Since there are few direct competitors, MLB tickets compete against generic budget competitors for discretionary spending
Categories of tickets	Few. Typically coach and first class, with some variations.	Many, depending on location and amenities.
Risk for perceptions of price unfairness	Low. Prices tend to move as an industry, so perceptions of unfairness by individual competitors is rare.	High, if a competitor allows prices to rise unrestrained for high demand games.
Impulse purchase	Low. Buyers often make purchase decisions several weeks prior to departure. Impulse purchases are infrequent.	Varied. Some purchases are made weeks/months in advance, but many tickets are sold based on an impulse basis on the day of game.

A second key distinction between the airline and MLB industries is that MLB ticket buyers are both consumers and fans. A fan has a monetary value that is in addition to the ability to purchase single game tickets, including pre-sold (season/package) tickets, media viewership, parking concessions, and the purchase of licensed merchandise. Perceptions of price unfairness among the fans of a particular MLB team potentially impacts these additional revenue streams. MLB teams are advised to avoid maximizing the ticket revenue stream for exceptionally high demand tickets at the risk of triggering perceptions of price unfairness, which would lower behavioral intention to re-purchase and lower overall lifetime revenue.

The Zone of Reasonableness and MLB Ticket Pricing

Another key distinction between airline and MLB ticket pricing is the effect of the secondary market (StubHub) on primary market ticket sales. Unlike the primary market, the MLB secondary market operates on a more market driven basis for ticket pricing with less of a concern for perceptions of price unfairness or the potential negative effects of having ticket prices fall below the prices paid by season ticket holders. If a ticket with an initial value of $100 is sold later on StubHub for $300, the perceptions of price unfairness are focused on the secondary market provider (StubHub) and not the MLB team that no longer controls the ticket price. The secondary market is also unconcerned with any effects of price unfairness when individual game tickets fall below the per game ticket price paid by a season ticket holder. This frequently results in a broader range of potential ticket prices found in the secondary market, compared to the restricted range of prices in the primary market.

Figure 1: The Zone of Reasonableness for MLB Ticket Pricing



One way of understanding the differences of DP in the primary and secondary markets is through the application of the "zone of reasonableness" pricing concept to the field of dynamic pricing. The zone of reasonableness is a concept used in both energy pricing (Fox-Penner and Wharton, 2007) and freight pricing (Drea and Hanna, 2006) to determine the floor and ceiling prices for a particular item. In the MLB primary market ticket pricing, the range of available ticket price positions is bounded on the lower end by the price per game paid by season ticket holders, and on the upper end by a price above which perceptions of price unfairness would likely develop. In the MLB ticket secondary market, the range of potential ticket prices is considerably broader, since the secondary market in unencumbered by perceived lower price limit imposed by season ticket holders or concerns of price unfairness as an upper limit. Not pricing below the per game price paid by a season ticket holder is believed to be an important mechanism to guarantee season ticket holders that they are receiving the best price per game for their tickets and that they would not benefit by purchasing tickets individually in the primary market. In 2013, MLB entered into an agreement with StubHub to establish a minimum ticket price of $6, which includes all transaction fees (Fisher, 2012), and this price establishes the lower price limit for the secondary market.

There is support that some professional sports teams use a "zone of reasonableness" concept when implementing DP. For example, a high demand MLB ticket would be the San Francisco Giants vs. Oakland Athletics at AT&T Park in San Francisco on Friday, July 24, 2015. A ticket purchased through the team in the lower box area was priced at $122.50 from primary market (SF Giants) vs. an average price of $162.15 in the secondary market (StubHub prices for this area ranged from $102.95 to $219.95). By comparison, a low demand ticket in a lower box area for the June 29, 2015 game between the Cincinnati Reds and the Minnesota Twins at Great American Ball Park in Cincinnati was priced at $37 in the primary market (Cincinnati Reds) vs. an average price of $24.85 in the secondary market (StubHub prices for this area ranged from $16.83 to $33.01). In each of these two examples, the MLB teams appear to have constrained the range of prices in the primary market in order to protect the interests of season ticket holders and fans.

Teams that routinely approach stadium capacity have the flexibility of pursuing additional pricing objectives beyond profit maximization. The St. Louis Cardinals, which use DP and routinely sell out, had 79% of home games in the 2014 season with some tickets priced at $10 or less and 36% of home games had some tickets priced for $5. (St. Louis Cardinals, 2015). This is done by making some areas unavailable for season ticket sales, such as high in the top deck of the stadium, and in some areas of the bleachers. These sentiments were echoed by Joe Strohm, VP for Ticket Sales from the Cardinals. "The biggest challenge was communicating the new pricing structure to our fans and overcoming the concern of season ticket holders that we would be undercutting their price. We have guaranteed season holders that we will never sell individual tickets below the game value of their ticket" (Rishe, 2012).

Carr and Lovejoy (2000) previously considered this goal of pricing in order to sellout as a poor strategy in industries such as airlines and hotels, but it may have value in professional sports ticket markets where the presence of a sellout has benefits for enhancing the attractiveness of a ticket and emphasizing the scarcity.

Discussion/Conclusions

For the majority of entities using DP, the primary pricing objective is profit maximization. While both airlines and MLB teams use DP and embrace profit maximization, the implementation of DP in each industry is substantially different. Some of these discrepancies are related to different market structures, with a) more direct competition and less brand differentiation in the airline industry and b) the presence of an active secondary market for MLB tickets. At the same time, it is worth noting that airlines have customers and MLB teams have fans, some of whom are ticket buying customers and all of whom contribute to the revenue stream for the MLB team. As a result, the implementation of DP in MLB ticket sales is different from the implementation of DP within the airline industry.

MLB tickets priced using DP are constrained at the upper and lower levels by the "fan as a customer" duality faced by team ticket staffs. The lower level of acceptable ticket prices is constrained by per game prices paid by season ticket holders, while the upper level of acceptable prices is constrained by issues of price fairness, which is more difficult to quantify. Secondary MLB ticket markets do not have these same constraints, which results in a greater level of price dispersion on the secondary market. These differences are represented by the zone of reasonableness pricing model.

As a tool for maximizing MLB ticket revenue, DP is most effective when the demand for tickets exceeds the perceived supply. This scenario allows an MLB team to extract more value from the transaction by setting a dynamically priced ticket higher than the price paid by a season ticket holder, yet below a price point that triggers perceptions of price unfairness. In a scenario where the demand for tickets does not exceed the supply, DP provides a basis for price discrimination by charging a higher price to buyers who purchase tickets within the last day before game time have the ability to pay a price premium for such decisions.

One of the issues for future research in this area is to quantify the costs incurred by MLB teams for the constraints that prevent teams from fully maximizing revenues (as occurs in the secondary market), and to determine what actions, if any, can be undertaken that would allow dynamically set process to fluctuate more fully in accordance with market demands.

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Author Information

Dr. John Drea earned his D.B.A in Marketing from Southern Illinois University. He is a Professor and Chair of the Management and Organizational Leadership Program at Illinois College, as well as Emeritus Professor of Marketing at Western Illinois University. His research has appeared in the Journal of Personal Selling and Sales Management, Transportation Journal, Journal of Services Marketing, Journal of Transportation Management, and numerous other outlets.

Mr. Andrew Nahlik earned his M.A in Economics from the University of Florida. He is an instructor in the Economics, Accounting, and Finance department at Illinois College. His previous research has been used in technical reports for various government agencies such as the Kentucky Department of Fish and Wildlife and the New Mexico Department of Game and Fish and other interested parties.