How Marketing Strategies, Particularly Ticket Prices in the NBA, Affect Attendance and Revenue

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Abstract. Recently, the NBA has been increasingly gaining prominence and dominating the industry, with the primary revenue stream being gate receipts. Within this article, we explore the correlation between demand and attendance to the ticket price, physical confrontation, and the average game duration. We gather data from our offline survey on lectures, and following data processing, we input it into our algorithm and utilize the output, such as p-value and coefficient calculated by the computer for analysis. Additionally, we compile additional data to conduct segmentation, positioning, and generate a perceptual map, and excel to illustrate our findings effectively. Lastly, we amalgamate the segmentation and positioning with the analytical data results, which validate the findings in our literature review and also provide novel insights. We ascertain that ticket prices are inflexible to the demand, whereas the physical confrontation exhibits a negative correlation with the demand in males but a positive one in females. Furthermore, the duration of the game is positively correlated with the demand, albeit marginally, indicating that demand will not alter easily.

Keywords: NBA, ticket price, correlation with demand, physical confrontation, duration of game

1. Introduction

1.1. Topic

The NBA is among the most prominent and well-liked professional sports leagues in the USA and Canada. The NBA earned over 10.58 billion US dollars in income in the 2022–2023 season. This substantial cash was generated from gate receipts, which accounted for 21.57% of total revenue in 2023. It is easier to observe that gate receipts contribute significantly to overall revenue than other revenue sources, especially compared to another significant revenue source—the NBA's sponsorship revenue accounted for more than 15% of total revenue in 2023 [1]. This article will examine how ticket prices and other marketing tactics impact attendance and revenue.

1.2. Literature review

In search of additional evidence demonstrating the link between ticket prices and other marketing strategies on attendance and revenue, I selected several essays offering significant findings to aid us

in comprehending the correlation between ticket prices and attendance and supporting subsequent data analysis and conclusions. Comprising the essay "Ticket Prices, Concessions and Attendance at Professional Sporting Events" [2], the demand for attending NBA games is rather inelastic with respect to ticket prices, signifying the inability of fluctuations in the NBA's ticket prices to alter attendance significantly. This implies that NBA fans exhibit minimal price sensitivity. Consequently, to optimize revenue, as the model suggests concession prices have no impact on attendance, the NBA should augment concession sales and pricing to generate a higher profit. The findings in this paper also endorse the notion that the inelastic ticket demand is attributed to the team price on tickets and other associated goods and services, such as the concession (food, drinks, merchandise). Furthermore, the author notes that gathering data on the purchase of components of fans' cost index, like beverages and other goods, can facilitate the study of ticket pricing and verify pricing concessions can maximize the revenue. Also, the article "Research Based on the Operation of NBA Marketing Strategy" [3] illustrates that seat location, the date of the game, and the basketball team participating in the match will influence ticket prices and ticket demand. Moreover, the scarcity of tickets will also escalate the price, which can be explained by the supply and demand curve. Where supply diminishes and demand remains constant, the price will rise. The author provides an example of the NBA Final in 2022: the average ticket price of The Warriors at home is 3249 dollars, and the average ticket price of the Celtics at home is 2862 dollars. This underscores that the scarcity of tickets will influence the ticket price due to the seating capacity of the Celtics home court being 19,580 people compared to the seating capacity of the Warriors being only 18,064 people. Therefore, it is evident that the seating capacity of the stadium also influences attendance, ticket demand, and ticket prices. When there is lower seating capacity in the stadium, the price will be relatively higher due to the scarcity of tickets, and when the demand for tickets increases, the price will escalate. Lastly, the essay "Factors Affecting Attendance at Professional Sports Events" [4] delves into various factors influencing attendance at professional sports events. The authors Hal Hansen and Roger Gauthier ascertain that the factors influencing attendance are uniform across different sports events, enabling different leagues to boost their attendance and revenue within a similar framework. The sample in the article reflects the relatively minor role of the ticket price in demand and affirms that factors influencing attendance in large outdoor facilities will surpass factors affecting attendance in smaller and indoor facilities. Since the NBA facilities are indoors, attendance will be more stable. Nonetheless, due to the relatively lower seating capacity of indoor facilities, they need to increase their ticket price to secure higher revenue, as the author points out.

1.3. Value proposition

The article endeavors to establish the relationship between ticket price and attendance and how attendance and ticket price influence revenue. Acquiring enhanced knowledge about the correlation between ticket pricing, attendance, and revenue can enable teams to maximize their income, in addition to the NBA identifying more specific marketing strategies to generate higher profits from our study and research. Moreover, this article will benefit marketing scholars; the process and the conclusion can assist marketing scholars in better understanding the rationale behind the ticket price setting of the NBA and how the NBA maximizes its revenue, which is a typical case of marketing. The findings can serve as the framework for other sports events to cater to their demand, maximize their revenue through ticket pricing, or inspire other events to generate higher profits.

2. Segmentation

For the segmentation, I classify NBA consumers based on their income (Under \$30,000, \$30,000 - \$49,999, \$50,000 - \$69,999, \$70,000 - \$99,999, \$100,000 - \$199,999, and \$200,000 and over), gender (male, female), age range (13-17 years, 18-24 years, 25-34 years, 35-44 years, 45-54 years, 55-64 years), region (South, Northeast, Midwest, West), and geography (international, domestic). Figure 1 amalgamates gender, age cohort, and income into one table. However, owing to the data constraints, we are still determining the proportion when diverse segmentation is combined. For instance, we only know that the percentage of those aged 13-17 years is 12%, and we cognize that income under \$30,000 constitutes 16%, yet we cannot ascertain the percentage of consumers aged 13-17 and income under \$30,000. Although we cannot obtain the precise proportion of the amalgamation, we can speculate by identifying the highest and the lowest group of consumers in each segmentation. We discern those male consumers aged 35-44 with income reaching \$100,000-\$199,999 and over are the highest group in the table, and vice versa. Female consumers aged 55-64 with an income of \$200,000 and over are the lowest group. Nonetheless, it can offer us a predictive insight into the share of each segmentation.

gender		Age Group/income	Under \$30,000	\$30,000 - \$49,999	\$50,000 - \$69,999	\$70,000 - \$99,999	\$100,000 - \$199,999	\$200,000 and over
		13-17 years	12%, 16%	12%, 13%	12%, 12%	12%, 20%	12%, 32%	12%, 6%
		18-24 years	14%, 16%	14%, 13%	14%, 12%	14%, 20%	14%, 32%	14%, 6%
		25-34 years	22%, 16%	22%, 13%	22%, 12%	22%, 20%	22%, 32%	22%, 6%
		35-44 years	27%, 16%	27%, 13%	27%, 12%	27%, 20%	27%, 32%	27%, 6%
		45-54 years	16%, 16%	16%, 13%	16%, 12%	16%, 20%	16%, 32%	16%, 6%
male	58%	55-64 years	9%, 16%	9%, 13%	9%, 12%	9%, 20%	9%, 32%	9%, 6%
		13-17 years	12%, 16%	12%, 13%	12%, 12%	12%, 20%	12%, 32%	12%, 6%
		18-24 years	14%, 16%	14%, 13%	14%, 12%	14%, 20%	14%, 32%	14%, 6%
		25-34 years	22%, 16%	22%, 13%	22%, 12%	22%, 20%	22%, 32%	22%, 6%
		35-44 years	27%, 16%	27%, 13%	27%, 12%	27%, 20%	27%, 32%	27%, 6%
		45-54 years	16%, 16%	16%, 13%	16%, 12%	16%, 20%	16%, 32%	16%, 6%
female	42%	55-64 years	9%, 16%	9%, 13%	9%, 12%	9%, 20%	9%, 32%	9%, 6%

Figure 1. Table amalgamates gender, age cohort, and income

Furthermore, I constructed Figure 2, which encompasses all the segmentation. The segment identified in red represents the highest in its classification, while the segment identified in blue signifies the lowest. For income segmentation, I designate fans with an income level of \$49,999 or below as low-income consumers; these consumers typically have limited disposable income for the cost of tickets and are more inclined towards watching the game via television or participating in promotional activities. The NBA can derive revenue from television broadcasts, organizing promotional activities, and offering budget-friendly NBA merchandise such as discounted jerseys to maximize profit. For middle-income fans, I identify consumers with an income level of \$50,000 -\$99,999. These consumers possess moderate income and show increased sensitivity toward ticket prices. Moreover, they benefit from diverse ticket types, family packages, and group discounts. The NBA must establish a pricing strategy that balances sales volume and price to optimize attendee turnout and achieve enhanced gate revenue. Lastly, I designate consumers with income levels exceeding \$100,000 as high-income fans. These affluent individuals purchase premium tickets and have access to luxury suites or VIP areas. Amongst the data, they constitute the largest proportion at approximately 38%, thus making significant contributions to the NBA's revenue. Mark Cuban would serve as a prime example; he is both a genuine fan and owner of the Mavericks team, often attending Mavericks games and relishing the game from the front-row seat, which commands a considerable price [5]. This group of consumers exhibits lower price sensitivity due to their substantial income. Hence, the NBA can offer superior service conditions to justify higher ticket prices and generate substantial profits.

For the age group, we categorized into three groups: youth engagement (13-24), middle-aged adults (25-44), and older-aged adults (45-64). Youth engagement encompasses teenagers and young

adults, representing 26% of the total, and they are susceptible to influencers derived from popular culture and star players. Thus, the NBA can capitalize on the celebrity effect to augment its consumption impetus. Middle-aged adults exhibit increased activity on social media and harbor strong basketball interest. This consumer group comprises the most significant proportion at 49%, accounting for nearly half of the total consumer accounts, thereby becoming the primary demographic for the NBA. The most minor proportion of fans would be older adults, who need more basketball passion. Consequently, they may not be the primary target consumers for the NBA. Still, the NBA would focus more on middle-aged adults and amplify their social media influence to gain greater exposure to this consumer group.

Moreover, most fans originate from the southern US, and the least number of fans originate from the northeast. From our collected data, we discern that there are five teams in the Northeast, 10 in the South, 8 in the West, and 7 in the Midwest. The proportional distribution of fans across the US regions correlates with the number of teams in each area. As the number of teams increases in an area, the proportion of fans also increases.

income	Under \$30,000	\$30,000 - \$49,999	\$50,000 - \$69,999	\$70,000 - \$99,999	\$100,000 - \$199,999	\$200,000 and over	
	16%	13%	12%	20%	32%	6%	
gender	male	female					
	58%	42%					
age	13-17 years	18-24 years	25-34 years	35-44 years	45-54 years	55-64 years	
	12%	14%	22%	27%	16%	9%	
region	south	northeast	midwest	west			
	37%	18%	22%	23%			
geographic	international	domestic					
	75%	25%					

Figure 2. Table encompasses all the segmentation we have [6]

3. Positioning

Numerous factors contribute to the NBA's success in marketing, notably its unique positioning amidst other professional sports competitions. By differentiating itself as a high-scoring, swiftly executed sport incorporating suitable physical competition within the game, it sharpens the excitement level. It presents a compelling visual spectacle for its patrons. Furthermore, in virtually all sporting events, accessibility is a crucial attribute for positioning; increased accessibility results in diminished obstacles for consumers to partake in live games. Consequently, establishing a suitable stance on the game's accessibility will render the brand more competitive than others.

Our team selected two pivotal attributes and constructed a perceptual map that illustrates the NBA's position relative to other prominent professional sports leagues: NFL and MLB. Initially, we gathered data on the average game duration and the average ticket cost in these three leagues [7,8]. Moreover, we rank the physical confrontation level of four leagues by giving their physical confrontation score from 1-3. Finally, we get the data shown in Figure 3.

	NBA	NFL	MLB
physical confrontation level	2	3	1
avearge price	94\$	94\$	53\$
average game length	150min	210min	180min

Figure 3. Table encompasses the level of physical confrontation, average game time and average price in NBA, MLB, NFL

Furthermore, we utilize average price and average game time to depict availability. Subsequently, we rank each league's average price and average game time from 1-3. For average price, because lower values suggest higher availability, the MLB average price rank shall be 2, and the NBA and

NFL marks are 1. A longer game time will result in higher availability due to consumers' increased willingness to engage in a prolonged game. Hence, we rank the average game time of the NBA as 1, the MLB mark as 2, and the NFL mark as 3. Lastly, we will summate the average price and average game time score we obtain and divide it by 2; we will ultimately derive the mean of these two factors. The means we acquire is the availability we employ in our perceptual map. To render every brand position discernible, we multiply availability and physical confrontation levels by 10. The perceptual map we generate is illustrated in Figure 4.

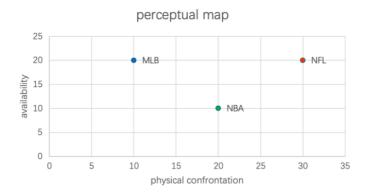


Figure 4. Perceptual map

The NBA strategically caters to a moderate physical engagement level. A significant rationale behind this positioning is the constraints imposed by basketball regulations. Nonetheless, an acceptable degree of physical confrontation may introduce engaging gameplay and enhance the visual spectacle. Consequently, it will entice more patrons with its compelling in-game aesthetics. In terms of accessibility, the NBA ranks lowest among the three league spectacles on the map, a notable rationale being that, as noted in the literature review, the indoor arena will yield lower seating capacities, necessitating brands to escalate their pricing to generate more revenue, also due to consumers being less price-sensitive, a higher price could yield higher revenue. However, elevated prices invariably reduce accessibility, which the NBA cannot circumvent. From the average game duration perspective, the NBA receives low scores due to the rule of basketball as well. Hence, the NBA could offer a prolonged experience for patrons by devising more activities during the game to augment accessibility.

4. Data analysis

To ascertain the influence of ticket pricing and alternate variables, such as physical confrontation conditions, on attendance and revenue, our team collaborated with other research groups to amass the data. Our assessment endeavors to determine how alterations in three attributes - price (attribute 1), physical confrontation (attribute 2), and average game duration (attribute 3) - impact the preference for diverse sports events (NBA, MLB, NFL). We maintained three attributes in MLB and NFL as the competitor of NBA consistently to ensure the experiment possesses only one variable. Furthermore, we were able to identify the consumer's responsiveness to these three attributes, enabling us to derive the elasticity between the three attributes and demand. This could further assist us in determining how ticket pricing can generate increased attendance and elevated revenue. We segmented the data of females and males; hence, I will evaluate female data initially.

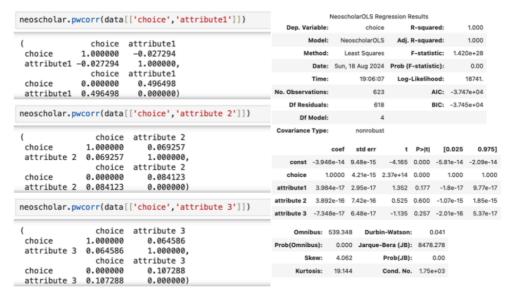
It is noteworthy that we assigned the value of 1 to indicate choosing the NBA and 0 to signify choosing other leagues in the selection of the data. Below Figure 5 is the female data we obtained

post-survey.

	attribute1	attribute 2	attribute 3	gender	choice	attribute1(0)	attribute 2.1	attribute 3.1	attribute1(0).1	attribute 2.2	attribute 3.2
0	36	3	135	female	1	93	3	192	31	1	162
1	46	3	135	female	1	93	3	192	31	1	162
2	56	3	135	female	1	93	3	192	31	1	162
3	66	3	135	female	1	93	3	192	31	1	162
4	76	3	135	female	1	93	3	192	31	1	162
618	76	1	150	female	1	93	3	192	31	1	162
619	86	1	150	female	1	93	3	192	31	1	162
620	96	1	150	female	1	93	3	192	31	1	162
621	106	1	150	female	1	93	3	192	31	1	162
622	116	1	150	female	1	93	3	192	31	1	162
623 rows × 11 columns											

Figure 5. Female data from post-survey

Subsequently, we integrated this data into the code and identified the correlation between 'choice' and 'price,' '/ physical confrontation,' and '/ game time.' From the data provided from (a) in Fig 6, following analysis of the correlation coefficient, it is observed that the price displays a weak negative correlation with the choice, while the physical confrontation and game time exhibit a weak positive correlation with the choice. Consequently, we can ascertain that an increase in price will result in a marginal decrease in the probability of selecting the NBA for female consumers, indicating that the consumers' demand is relatively inelastic regarding the ticket price of the NBA. An augmentation in the level of physical confrontation and duration of the game will marginally increase the likelihood of selecting the NBA.



(a) The result of correlation coefficient on female (b) Result of all analysis data on female from code

Figure 6. Data analyze results from code of female

However, from chart(b) in Fig 6, the three attributes' p-values we attained are greater than 0.05, indicating our null hypothesis is repudiated. Furthermore, I identified the regression line through the chart on the right. Presuming our regression line function is choice=const+coef(1)*price+coef(2)*physical confrontation level+coef(3)*time of the game, then we input the constant and coefficients we retrieve from our result chart in it. We ultimately obtained

the function: choice=-3.946e-14+(3.984e-17)*price+(3.892e-16)*physical confrontation level+ (-7.348e-17) *time of the game.

For the male NBA consumer, we input the data we gather into code and generate the chart(a) in Fig 7. The study discerns male consumers exhibit a weak negative correlation between price and physical confrontation to the likelihood of choosing the NBA, while they exhibit a weak yet positive correlation with the time of the game. Though this contradicts our initial supposition that males value physical confrontation more at the event, there remains an opportunity that male consumers might not emphasize physical confrontation significantly. From the chart(b) below in Fig 7, we ascertain that the p-values of all attributes remain higher than 0.05, signifying the null hypothesis still being denied in male consumers. Nonetheless, we can identify the regression function through the result. We utilize the same method mentioned in identifying female consumers' regression function; we will attain: choice =4.441e-15+(9.95e-17)*price+(2.138e-16)*physical confrontation+(2.621e-17)*time of the game.

neoscholar.pwcorr(data[['choice','attribute1']])			oscholarOLS				
	Dep. Va	riable:	cho	ice	R-squared	:	1.000
(choice attribute1		Model:	NeoscholarC	LS Adj	j. R-squared	0	1.000
choice 1.00000 -0.00185 attribute1 -0.00185 1.00000.	м	ethod:	Least Squa	res	F-statistic	4.20	6e+26
attribute1 -0.00185 1.00000, choice attribute1		Date: S	un, 18 Aug 20	24 Prob	(F-statistic)		0.00
choice 0.000000 0.968952		Time:	21:11	51 Los	g-Likelihood		12964.
attribute1 0.968952 0.000000)	No. Observ	otione		45		-2.59	
neoscholar.pwcorr(data[['choice','attribute 2']])	Df Res		4	40	BIC	: -2.59	0e+04
	Df Model:			4			
choice attribute 2	Covariance	Type:	nonrob	ust			
choice 1.000000 -0.032219			f std err				
attribute 2 -0.032219 1.000000,		coe		t		0.025	0.9
choice attribute 2	const	4.441e-1	5 3.44e-14	0.129	0.897 -6.3	31e-14	7.2e
choice 0.000000 0.497819 attribute 2 0.497819 0.000000)	choice	1.000	2.46e-14	4.07e+13	0.000	1.000	1.0
attribute 2 0.497019 0.000000)	attribute1	9.95e-1	7 9.02e-17	1.103	0.271 -7.7	78e-17	2.77e
neoscholar.pwcorr(data[['choice','attribute 3']])	attribute 2	2.138e-1	2.27e-15	0.094	0.925 -4.2	25e-15	4.68e
	attribute 3	2.621e-1	7 1.99e-16	0.131	0.895 -3.6	66e-16	4.18e
choice attribute 3							
choice 1.000000 0.107561	Omni	ibus: 498	3.305 Dur	bin-Watso	n: 0.0	14	
attribute 3 0.107561 1.000000,	Prob(Omnib	bus): (.000 Jarqu	e-Bera (JB	3): 28239.17	79	
choice attribute 3	s	kew:	5.090	Prob(JB	3): 0.0	00	
choice 0.000000 0.023256	Kurt	osis: 40	0.675	Cond. N	o. 2.29e+0	03	
attribute 3 0.023256 0.000000)							

(a) The result of correlation coefficient on male (b) Result of all analysis data on male from code

Figure 7. Data analyze results from code of male

Regardless, the outcomes for both genders remain comparable. Through this, we affirm the concept mentioned in the literature review that the demand for consumers within the NBA is inflexible with regard to price; thus, to elevate revenue, the NBA could establish a higher price point. The novel insight derived from the investigation is that the rise in physical contact and duration of the match will induce a marginal increase in demand for the NBA. Thus, the NBA could strive to amplify its physical contact and playing duration, boosting the spectating experience, which augments their demand. The surge in demand will cause the price of tickets to escalate as well, thereby generating a nominal profit. Nevertheless, this data cannot fully elucidate the consumer elasticity and the result we obtained because the survey still had some issues. For example, the respondent did not diligently complete the survey, which introduces an error in the result. Our high p-value also implies the result contains anomalies. However, it can still serve as an estimate or benchmark for discerning the relationship between the ticket price, physical contact, and duration of the match with demand.

5. Conclusion

In summation, we ascertain that the ticket price of the NBA is inflexible with its demand, and the pricing strategy will only have a modest adverse effect on the demand. Consequently, the NBA should endeavor to set higher prices to diminish the potential overhead of low seating capacity due to its indoor stadium and to attain superior revenue. The data we scrutinize substantiate the notion in the literature review as well, fortifying that the consumer of the NBA is inflexible to the price. Physical contact exhibits a negative relationship with the demand of male consumers, which contradicts our initial proposal, but in females, it remains positive. For the duration of the game, it is positive but still only precipitates a marginal shift in the demand. As the ticket prices escalate, it will impact more on middle-income fans who are more price-conscious but will not create a significant impact on the majority of fans. Team performance will also influence price setting and attendance; hence, when the team performs well, revenue will be augmented by higher demand and price setting, and vice versa. To optimize the revenue, teams should augment sales on their concession so that revenue is not solely dependent on the ticket price. Enhancing visual experiences (physical contact and playing duration) for consumers is crucial so that prices can be set higher and attendance increases, albeit the change is marginal.

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