

Ticket Structure and Price Optimization

First Pitch: MBA Sports Business Case Competition



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Saturday March 3, 2012



42ANALYTICS



Executive Summary

- Ticket pricing and structure decisions for a given franchise with the objective of optimizing capacity utilization and maximizing revenue should be made based on qualitative assessment of the market and quantitative assessment of the teams current ticketing structure
- Metropolitan population, wealth, number of large companies, and fan sentiment are the key determining factors for optimal stadium capacity and seat mix
- Expected value of Win/Loss over time will be 50%, data reflects that winning is not a large determinant of optimal capacity and allocation, however legacy and winning percentage are significant determining factors for game attendance
- Secondary market prices generally reflect team performance more so than optimal capacity and seat mix

Determine Optimal Stadium Capacity

- Regression analysis on a multitude of variables identified population, number of wealthy households, number of large businesses, and fan rankings as key drivers of stadium size and game attendance

Regression Variables

- Population of MSA
- Median Income of MSA
- Number of Households with income >\$150k
- Average Seat Price
- Fan Cost Index
- Win Percentage (average last three years)
- Fan Rank Index (ESPN.com 2008 Ranking)
- Wait List Length
- Number of Major Sports teams in MSA
- Number of Business Establishments over 500 Employees

Capacity Drivers

Population

Wealthy Households
(>\$150k income)

Large Businesses
(>500 employees)

Fan Rank Index

- See Appendix for regression tables

Determine Optimal Stadium Capacity

City	Population ¹	Wealthy Households	Large Company Index ²	Fan Rank Index ³	Optimal Capacity
Los Angeles Bulldogs	5,569,780	10.22%	75	35.00	75,000
Portland Cobras	1,190,010	7.50%	2	52.38	65,000
Oklahoma City Kings	712,630	5.17%	9	85.71	70,000
San Antonio Sharks	880,690	5.35%	15	57.14	65,000

1) Number of TV Households in each Metropolitan Statistical Area (MSA)

2) Shows presence of Fortune 500 Companies and 500+ employee companies in each MSA, based on US 2010 Census Data

3) Fan Rank Index from ESPN.com

Determine Ticket Mix

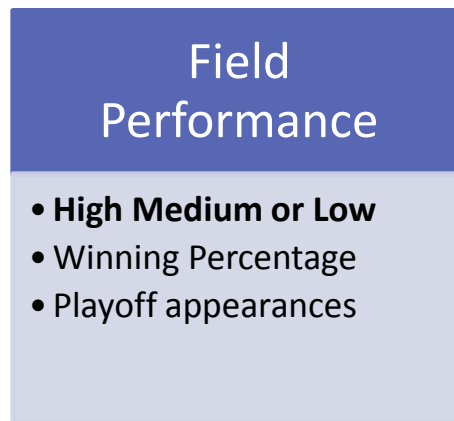
- We use a top down approach to determine overall optimal stadium capacity based on upper, middle, lower quartiles of existing 32 stadiums
- Club/Suite asset mix determined by household wealth, number of large companies, number “Big 4” substitutes, and fan rank

Seat Type	Drivers	Calculation
General Admission	<ul style="list-style-type: none">• Population• Fan Rank Index	Capacity - Minus: Club Seats - Minus: Suites x 10
Club Seats	<ul style="list-style-type: none">• Wealthy Households (>\$150k Income)• Large Companies (>500 employees)• Fan Rank Index	$(\text{HH Wealth} + \text{Large Firm})/2$ + Fan Rank Index = Total Optimized by quantile
Suites	<ul style="list-style-type: none">• Large Corporations (>500 employees)• Number of other major sports teams	Large Firm Index ¹ + Fan Rank Index = Total Optimized by quantile

1) Large firms percentile divided by 2. If more than three “Big 4” substitutes (i.e. NYC). Next we re-indexed the number of large firms to 100 (NYC). If Large Firm Index < 5, team is automatically placed in lowest suite quartile (GB, CLE).

Determine Ticket Price

- Average ticket price is a key determinant of attendance and can be used to optimize sell through
- Research indicates demand is relatively inelastic with respect to winning percentage¹ and elasticity of demand is ~ 1
- Attendance NFL games is habit-forming. Owners can hope to increase demand in the long run by keeping prices relatively elastic
- While prices increases are warranted during “winning” periods, this could lead to dramatic drops in attendance when experiences a period of losing seasons



1) The Demand For NFL Attendance: A Rational Addiction Model, Journal of Business and Economic Research, by Erin LeAnne Spensor, Aju Fonn, John Crooker, Dec 2010, vol 9, no 12.

Ticket Price: Art meets Science

- We checked our proposed model against the existing 32 stadiums and considered the following qualitative factors:
 - 1) Team Legacy
 - 1) Post-season success (i.e. Packers)
 - 2) Age and history of stadium (Lambeau Field)
 - 2) Existing Analogs in the desired market
 - 1) Los Angeles - six major “Big 4” analogs to check against, as well as two major collegiate fan bases. Additionally a Staples Center all purpose box sells between \$250-400k for year for all events (125-200k per team)
 - 2) Oklahoma City – Thunder are primary analog, loyal fan base, look at nationally televised marquee games
 - 3) Secondary Market Prices
 - 1) Secondary market existence crucial to allow fans to offload tickets in the event of conflict
 - 2) Processing and handling fees in secondary market range around 10-20%, assume ticket brokers need to turn a 20-30% profit to stay open and keep the market going, therefore secondary market mark-ups of 30-50% indicate list prices are appropriate

Ticket Prices: Data applied to our 4 cities

1) General Admission:

- 1) We used the Average Seating Prices from the 32 existing NFL teams, broke out historical Win/Loss, Stadium Age, and separated into three quantiles (low, medium, high). We then factored in cost of living adjustments to find our base general admission price (see Appendix 1)
- 2) Fan Cost Index Data (teammaking.com) supports that marginal price decreases <20% can be compensated for with revenue from concessions and parking, but merely offset lots ticket revenue

1) Club Seating:

- 1) Average Club seating prices trends between 350-400% above general admission, used the same methodology for general admission tickets marked up 400%

2) Suite Pricing:

- 1) We extrapolate the suite delta adjustment, and compare using the same quantiles we calculated for the revised ASP's for general admission
- 2) Adjust for qualitative factors listed on previous slides

1) <http://www.bizjournals.com/bizjournals/on-numbers/scott-thomas/2011/09/six-communities-are-off-the-charts-in.html?appSession=71988702831956>

2) <http://www.cityrating.com/costofliving.asp>

Los Angeles Bulldogs Recommendation

Qualitative Assessment

Large Market	General Admission	•Big city and population
	Club Seats	•Large affluent population
	Suites	•Large corporate presence
Moderate Elasticity	Current interest in sport or franchise	•Improving winning percentage
	Historical interest in sport or franchise	•Moderate season ticket waitlist
	Substitutes	•6 other professional sports teams •2 major college teams

Quantitative Assessment

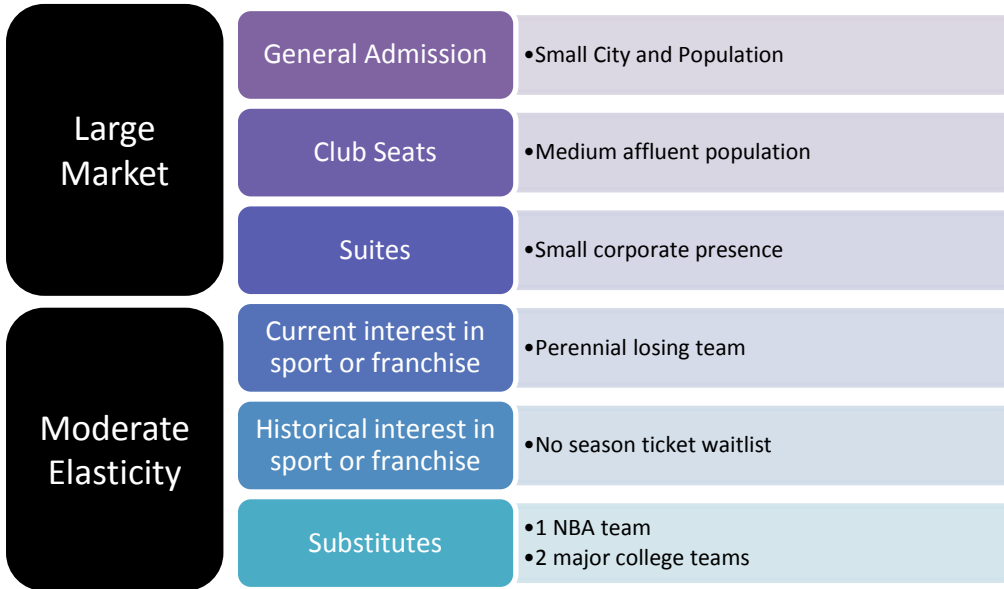
- 57% average 2nd market premium consistent with thesis
- Reduce club seats by 2,000 – positive HH wealth effect offset by low fan sentiment, raise prices to \$355
- Reduce suite capacity by 25
- Legacy and increased Fan Rank are critical to support higher prices

Recommendation

Ticket Type	Change in Quantity	New Quantity	Change in Avg. Price	New Avg. Price	Tiers	Sell Through %*	Change in Revenue (yr)*
General Admission	+500	65,500	\$17	\$101	8	100%	\$85,000
Club Seat	-2000	8,000	\$0	\$355	3	90%	\$1,450,000
Suite	-25	150	\$15,000	\$134,000	3	87%	\$2,250,000

Portland Cobras

Qualitative Assessment



Quantitative Assessment

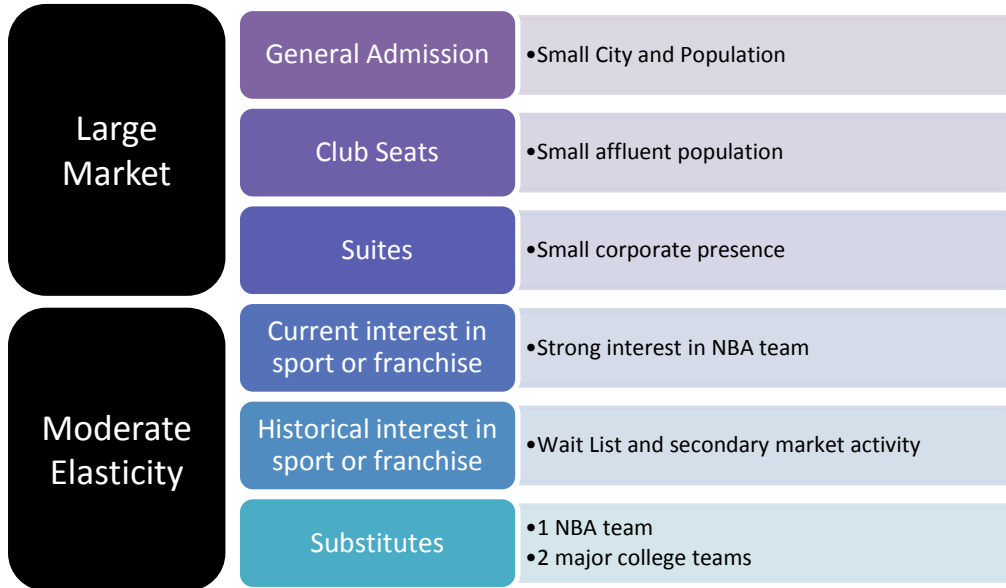
- Current general admission figures indicate tickets are over priced
- Reduce club seats by 4,000 – will create demand allow team to keep prices constant or marked up, increase general admission rev
- Reduce suite capacity by 50
- Fan rank is at median, but lack of corporate presence does support current suite quantity
- Since NFL attendance is habit forming, key is getting fans in seats

Recommendation

Ticket Type	Change in Quantity	New Quantity	Change in Avg. Price	New Avg. Price	Tiers	Sell Through %*	Change in Revenue (yr)*
General Admission	-4800	60,200	-\$6	\$65	8	95%	\$447,000
Club Seat	-4000	4,000	\$30	\$300	3	100%	-\$3,500,000
Suite	-50	80	\$0	\$120,000	3	100%	\$603,600

Oklahoma City Kings

Qualitative Assessment



Quantitative Assessment

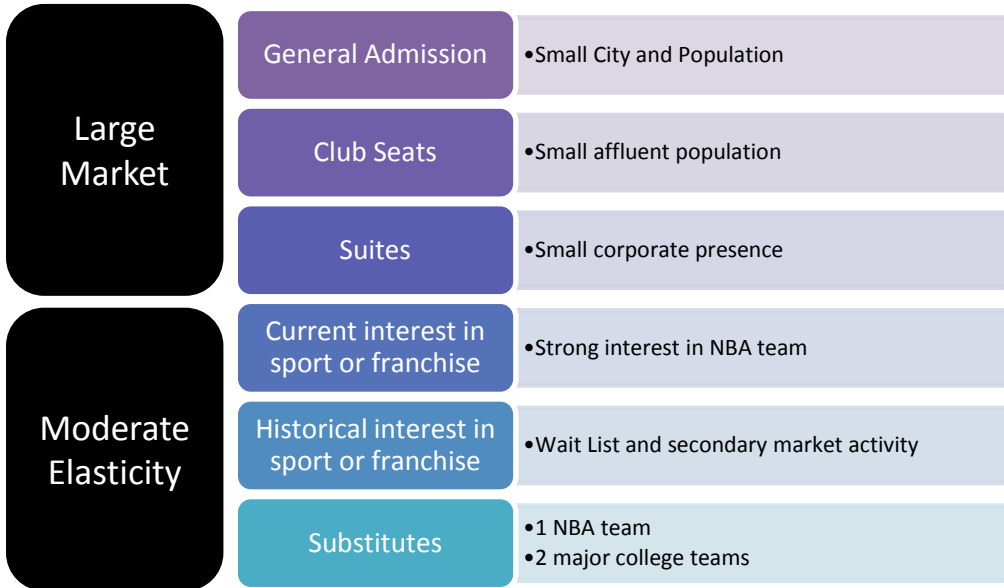
- Current general admission figures indicate tickets are under priced
- Increase club seats by 2,000 – keeping prices constant, may not sell out, but demand is there
- Fan rank is very strong
- Reduce number of suites by 40, increase prices

Recommendation

Ticket Type	Change in Quantity	New Quantity	Change in Avg. Price	New Avg. Price	Tiers	Sell Through %*	Change in Revenue (yr)*
General Admission	-2200	60,800	\$15	\$90	8	100%	\$7,470,000
Club Seat	+2000	8,000	\$0	\$270	3	100%	\$4,450,000
Suite	-40	120	\$0	\$135,000	3	100%	\$708,000

San Antonio Sharks

Qualitative Assessment



Quantitative Assessment

- Current general admission figures indicate tickets are under priced
- Increase club seats by 4,000 – keeping prices constant, may not sell out, but demand is there
- Fan rank is at median, some corporate presence to support additional suite quantity

Recommendation

Ticket Type	Change in Quantity	New Quantity	Change in Avg. Price	New Avg. Price	Tiers	Sell Through %*	Change in Revenue (yr)*
General Admission	-2000	58,000	\$15	\$90	8	100%	-\$2,745,000
Club Seat	+4000	6,000	\$0	\$350	3	95%	10,100,000
Suite	+10	100	\$0	\$220,000	3	100%	\$2,200,000

Appendix – Suggested Stadium Size, ASP and Mix of Seats

Team Name	Stadium Size			ASP			Number of Suites	Number of Club Seats	Number of Gen Admin
	Current	Suggested	Delta	Current	Suggested	Delta			
Chicago Bears	61,500	75,000	13,500	102	98	(4)	150	10,000	63,500
Indianapolis Colts	63,000	70,000	7,000	85	80	(5)	120	6,000	62,800
Oakland Raiders	63,026	75,000	11,974	62	65	3	120	10,000	63,800
Arizona Cardinals	63,400	70,000	6,600	68	70	2	80	2,000	67,200
Minnesota Vikings	64,121	75,000	10,879	76	65	(11)	100	6,000	68,000
Detroit Lions	64,500	65,000	500	62	70	8	80	1,000	63,200
Pittsburgh Steelers	65,050	75,000	9,950	74	95	21	150	10,000	63,500
Cincinnati Bengals	65,790	65,000	(790)	72	70	(2)	80	2,000	62,200
Tampa Bay Buccaneers	65,857	70,000	4,143	71	65	(6)	120	8,000	60,800
St. Louis Rams	66,965	65,000	(1,965)	70	65	(5)	80	2,000	62,200
Seattle Seahawks	67,000	75,000	8,000	67	95	28	120	8,000	65,800
Jacksonville Jaguars	67,164	65,000	(2,164)	59	65	6	80	2,000	62,200
New England Patriots	68,756	75,000	6,244	118	118	()	120	10,000	63,800
Tennessee Titans	69,143	65,000	(4,143)	64	90	26	100	6,000	58,000
Philadelphia Eagles	69,144	75,000	5,856	69	95	26	150	10,000	63,500
San Francisco 49ers	69,732	75,000	5,268	84	88	4	100	8,000	66,000
Baltimore Ravens	71,008	65,000	(6,008)	87	75	(12)	100	4,000	60,000
Houston Texans	71,054	75,000	3,946	73	70	(3)	150	8,000	65,500
Atlanta Falcons	71,228	75,000	3,772	69	75	6	150	8,000	65,500
San Diego Chargers	71,294	70,000	(1,294)	80	83	2	120	8,000	60,800
Buffalo Bills	73,079	65,000	(8,079)	59	65	6	100	6,000	58,000
Green Bay Packers	73,128	65,000	(8,128)	76	90	14	80	8,000	56,200
Cleveland Browns	73,200	70,000	(3,200)	54	65	11	80	8,000	61,200
Carolina Panthers	73,778	70,000	(3,778)	63	65	2	100	6,000	63,000
Miami Dolphins	75,192	65,000	(10,192)	70	65	(5)	80	2,000	62,200
Denver Broncos	76,125	75,000	(1,125)	77	95	18	100	8,000	66,000
Kansas City Chiefs	76,416	70,000	(6,416)	67	65	(2)	120	8,000	60,800
New Orleans Saints	76,468	65,000	(11,468)	75	90	15	100	6,000	58,000
Dallas Cowboys	80,000	75,000	(5,000)	110	70	(40)	150	8,000	65,500
Washington Redskins	82,000	75,000	(7,000)	79	83	3	120	10,000	63,800
New York Giants	82,566	75,000	(7,566)	112	136	24	150	10,000	63,500
New York Jets	82,566	75,000	(7,566)	121	99	(22)	150	10,000	63,500
Los Angeles	75,175	75,000	(175)	84	101	18	150	8,000	65,500
Portland	73,130	65,000	(8,130)	71	65	(6)	80	4,000	60,200
Oklahoma City	69,160	70,000	840	75	90	15	120	8,000	60,800
San Antonio	62,090	65,000	2,910	93	90	(3)	100	6,000	58,000

	Correlations	
	Stadium Size	Attendance
Population Size	40.3%	14.7%
Population Index	16.7%	22.0%
Median Income	(0.3%)	8.7%
HH over 150K	16.5%	14.1%
ASP	35.8%	47.1%
FCI	37.1%	47.4%
Win Percentage	5.6%	50.9%
Fank Ranking Index	30.7%	24.9%
Wait List Index	10.0%	44.0%
Substitutes	35.3%	3.9%
Ticket Attendance	11.1%	N/A
500+	41.2%	26.4%
Year Opened	21.10%	14.65%

- Correlation stadium size to ticket attendance

Appendix – Regression for Stadium Size with chosen variables

Stadium Size Regression

<i>Regression Statistics</i>	
Multiple R	64.59%
R Square	41.72%
Adjusted R Square	33.09%
Standard Error	4,887
Observations	32

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance</i>	
					<i>F</i>	<i>F</i>
Regression	4	461,646,534	115,411,634	4.8	0.45%	
Residual	27	644,820,510	23,882,241			
Total	31	1,106,467,044				

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	61,983	2,862	22	0.00%	56,111	67,855	56,111	67,855
Population Index	(137.7)	55.2	(2.5)	1.91%	(251)	(24.40)	(250.99)	(24.40)
500+ Establishments	0.4	0.1	3.6	0.13%	0.18	0.65	0.18	0.65
Fan Rank Index	88.7	33.9	2.6	1.43%	19.18	158.28	19.18	158.28
HH > 150k	43,786.3	23,785.0	1.8	7.66%	(5,017)	92,589	(5,017)	92,589

Appendix – Regression for ticket attendance with chosen variables

Ticket Attendance Regression

<i>Regression Statistics</i>	
Multiple R	55.14%
R Square	30.41%
Adjusted R Square	25.61%
Standard Error	5.78
Observations	32

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>Significance</i>	
				<i>F</i>	<i>F</i>
Regression	2	423.41	211.71	6.34	0.52%
Residual	29	969.03	33.41		
Total	31	1,392.44			

	<i>Coefficients</i>	<i>standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	84.8	3.9	21.9	0.00%	76.9	92.7	76.9	92.7
Wait List Index	4.31%	3.16%	1.4	18.26%	(2.15%)	10.77%	(2.15%)	10.77%
Win Percentage	17.8	8.3	2.1	4.05%	0.8	34.7	0.8	34.7