

# Variable Pricing at the New York Mets

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beta version: January 2010

No strategy will fill more empty seats at Shea than for the team's new manager to guide the Mets to a winning season. By all means, let the quest to win continue. Meanwhile, the team and its fans will gain by having prices that track [demand] more closely.<sup>1</sup>

All baseball games are not equal: It's not the same to play the Yankees on Sunday or the Royals on Wednesday — with no offense to either team or weekday. Such was the idea underlying the New York Mets' 2002 decision to switch from uniform to tiered pricing. "The more we studied it, the more it made sense to tailor pricing to match demand as much as possible," said David Howard, the Mets' senior vice president for business.<sup>2</sup> Was tiered pricing good for the Mets' finances? Did it have any influence on fan loyalty? Is tiered pricing the future of baseball?

## The New York Mets

Originally slated to be one of eight teams in the Continental League (a new baseball league that never got off the ground), the New York Metropolitan ("Mets") instead joined the National League and played their first game on April 11, 1962. Throughout the subsequent decades, the team has only reached the post-season six times, winning World Series championships in 1969 and 1986. For the past decade, the win-loss percentage has hovered around 50%, more frequently below than above (see Exhibit 1).

The Mets have always played "second fiddle" to the New York Yankees dynasty across town. Even when the two teams shared the World Series spotlight in 2000, the Yankees eclipsed the Mets at the gate, outdrawing them by about 4,000 tickets a game.<sup>3</sup> As Dave Howard puts it, "We have to be creative and sell tickets, while the Yankees are able to simply 'take orders' for season tickets."

## Ticket options

Mets fans can purchase tickets in several ways.

- Season tickets indicate the greatest level of commitment and entitle the owner to the same seat at each of the Mets' 81 home games.

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Written by Professor Luís Cabral for the purpose of class discussion rather than to illustrate either effective or ineffective handling of an administrative situation. This case is partly based on a previous case, "The New Mets," written by Professor JD Schramm with the research support and collaboration of Stuart Strauss. It is also partly based on the paper, "Aligning Pricing to Quality in Sports and Entertainment Businesses," written by John Asker and Luís Cabral. Thanks Dave Howard, Craig Marino, Tina Bucciarelli, and Toni Giordano (all from the New York Mets) for support in the development of various materials used in the case. © 2010 Luís Cabral.

- Fans who wish to see multiple games, but do not want to invest in the entire season, can choose from a variety of ticket plans enabling them to purchase weekend only or weeknight only combinations.
- The next level of commitment is to purchase one of seven different “Six-Packs” of predetermined games.
- Advance ticket sales for individual games begin in late February. The Shea Stadium Ticket Office usually sells as many as 100,000 seats on the first day of advance sales.
- Fans may continue to purchase tickets to individual games throughout the season.

For any of the five options, the most expensive tickets for any game would be those for central, close-to-the-field seats; the least expensive tickets would be for the far-away bleacher and upper-tier seats; and intermediate locations would command intermediate prices. (See Exhibits 5 and 6.) There are also a limited number of luxury suites available, primarily purchased by corporations for entertaining clients and employees.

### **Variable pricing**

Notwithstanding the variations in price across different stadium seats, until 2002 each particular seat was priced the same regardless of what game was being played. In the Fall of 2002, the Mets announced their plan to switch to tiered pricing. The idea was not novel to baseball: The Cubs, Colorado, Cleveland and San Francisco all had experienced some variation of tiered pricing.<sup>2</sup> But the Mets were probably the first team to implement a comprehensive tiered pricing strategy (“the New York Mets operate the most complex pricing structure in all of pro sports”<sup>4</sup>).

David Howard, the Mets’ senior vice president for business, explains that

The three principal factors that determine why a fan goes to a game are time of year, day of week and the opponent. In the summer months, attendance rises with school out, then we see a difference in attendance for weekends than midweek, and there’s a different demand for Yankees series than any other.

In 2003 the Mets initiated a variable ticket pricing plan. Each of the 81 home games was assigned to one of the four pricing tiers: value, bronze, silver, and gold. For example, many of the weekday games in April and September were the least popular and were placed in the “value” category ranging from \$8 to \$38 per ticket depending on location in the stadium. By the same token many of the weekend games during the summer months or those games against competitors such as the Yankees and Cardinals were categorized as “gold” and priced from \$16 to \$53.

### **The simple economics of variable pricing**

The idea of variable pricing is rather simple: to the extent that different games are subject to different demand patterns, setting different prices for different games allows for a better

adjustment of pricing to demand, leading to higher total revenues. Consider the example depicted in Exhibit 7, where two games have two demand patterns,  $D_L$  and  $D_H$ . By setting a uniform price, say  $\bar{p} = 8$ , total revenue is given by  $8 \times (4 + 28) = 256$ . However, by setting the optimal individual prices,  $p_L = 5$  and  $p_H = 11$ , total revenue is given by  $5 \times 10 + 11 \times 22 = 292$ , an increase of 14%.

The second thing to notice is that increased variability in pricing should be associated to decreased variability in attendance. In the example depicted in Exhibit 7, uniform pricing leads to attendance levels  $q_L = 4$  and  $q_H = 28$ , whereas variable pricing leads to attendance levels  $q_L = 10$  and  $q_H = 22$ , a considerable lower cross-game variation in attendance.

## Demand determinants

In order to go from theory to practice, we need to know what the demand for each game is (or is expected to be). As a preliminary issue, we must decide what data to analyze. Exhibit 8 shows the number of tickets sold per game for three selected seating sections. Games are ordered on the horizontal axis (81 per season) and the number of tickets sold is shown on the vertical axis. (The term “attendance” in the Exhibit’s title is not entirely correct as there may be tickets sold that do not correspond to actual attendance. However, for simplicity, if with some abuse of terminology, we will refer to attendance and tickets sold indiscriminately.)

Take for example the Metro Gold Club section. As can be seen from the top panel in Exhibit 8, almost all games have the same number of tickets sold. The reason is that most (if not all) of the tickets sold for this section are sold as season tickets. This in turn implies that the data cast no light on the issue of ticket demand on a game-by-game basis. Moreover, variable pricing has little effect on demand other than the effect it has on the overall cost of a season ticket (which in the particular case at hand was relatively small).

Consider now the case of Mezzanine Box tickets. The problem with this data is that, prior to 2003, we find a high density of points close to the maximum number of tickets sold (section capacity). This likely reflects capacity constraints, situations when ticket demand exceeds ticket supply. From an estimation point of view, this creates difficult problems. For example, the data suggests that the dispersion in the number of tickets sold increased with the introduction of variable pricing. However, the pre-2003 values are likely to underestimate the degree of demand dispersion, since many values are censored by Mezzanine Box capacity constraints.

Finally, the Upper Reserved case appears to be free from the problems raised by the Metro Gold Club and Mezzanine Box sections. First, the fact that there are so many games with so few tickets sold suggests that season tickets do not play an important role. Second, the low density of points near the top suggests that capacity constraints are not very important. For these reasons, we will henceforth concentrate our analysis on Upper Reserved ticket sales.

Based on thirteen years of historical data (1994–2004), Exhibit 11 presents the results of a simple OLS regression where the dependent variable is the number of tickets in the Upper Reserved section sold for a given game. Several other explanatory variables were considered but their effect was not significant. These include the Mets’ win percentage at the time of the game, the opponent’s win percentage at the time of the game, the starting pitcher (a baseball expert classified starting pitchers on a 1-2-3 scale); the weather forecast (temperature and precipitation).

The explanatory variables left from this elimination process are all 0-1 variables; the regression coefficient is therefore easy to interpret. For example, a game played on a weekend sells on average 1078.63 more tickets than a game played on a weekday; and so forth. Notice that, statistically, all coefficients are highly significant. From an economic point of view, the main determinants of ticket sales are, on a first level, playing against the Yankees or playing the season opener (about 9,000 extra tickets — in a section holding about 16,000); and at a second level playing in July or in October (about 3,000 extra tickets sold).

Finally, notice that the regression's  $\bar{R}^2$  is only 44%, that is, the model only explain a little less than half of the total variation.

□ **The effect of price on demand.** The most notable absence from the above list of explanatory variables is price. The main reason is that there is not enough variation in prices to obtain a reliable estimate of the price elasticity of demand. For a given stadium section and until 2002, all games during a given season were sold at the same price. Presumably, seasons where the team was better — or expected to be better — lead to higher prices. In 2003 and 2004, different games were sold at different prices, but the choice of price was endogenously determined by what the Mets expected would be higher demand games. In summary, prices are endogenously determined based on expected demand, which is a function of observable variables as well as variables that the analyst cannot observe (at least not this analyst).

To put this in a more dramatic way, consider Exhibit 12, depicting total annual sales and price for each season from 1994 to 2004. If we were simply to regress quantity on price, we would obtain a positive coefficient, which would be contrary to the law of demand and common sense.

While it is difficult to control for the factors that influence demand and prices (and thus control for the endogeneity of price formation), an event took place in 2004 that may allow us to say something about the effect of price on demand. With respect to the the 2003 season, in 2004 the Mets maintained all of their prices except the price of Value games in the cheaper seats (Out Field, Upper Reserved, Mezzanine Reserved, Loge Reserved). Specifically, the price dropped from \$8 to \$5.

By looking at the evolution of relative demand (Value with respect to Bronze, Silver and Gold), we may get an estimate of the effect of price on demand. The advantage of measuring variations in relative demand is that this insulates many of the unobservable factors that influence demand. Specifically, we may obtain an estimate of the demand elasticity by measuring the percent change in the ratio of demand for Value tickets with respect to other tickets; and dividing this by the percent change in price. Alternatively, we may measure the different in log values:

$$\epsilon = \frac{\log(r_2) - \log(r_1)}{\log(5) - \log(8)}$$

Based on this method, we obtain a demand elasticity estimate of approximately  $-.35$ .

### **The risks of price tiers and price changes**

Changing ticket prices in sports can be a tricky business; it's more than just a matter of regression analysis and algebra: the risk of losing fan support is potentially significant — especially when a team has performed poorly. To account for this possibility, The Mets'

new plan maintained the same price for 27 games and cut the price of 16 other games. However, anyone wanting to watch the Mets play the Yankees during the 2003 season had to pay 30 to 40% more than in the previous year.

Tiered pricing involves an additional risk: what if a Gold game opponent turns out to have a lousy season, or a Value game turns out to be a crucial playoff decider? One possibility is for the team management to change prices as the season progresses and more information arrives. However, David Howard guaranteed that the Mets would not raise or lower ticket prices as a function of team success.

A sports economics analyst claims that one reason why teams would not employ a differential pricing strategy is that they “would rather not acknowledge that one team’s entertainment value is higher than another’s.”<sup>5</sup> Then there is also the risk of upsetting opponents who find themselves in the “value” category. The Pirates were one such team, but General Manager Dave Littlefield did not seem very concerned: “I don’t worry about those types of things. We have to spend our energies improving our club. Whatever games they choose for discounting is their decision.”<sup>2</sup> It was not clear whether the Pirates’ players shared the same feeling.

## Two seasons of variable pricing

Based on data from two seasons of variable pricing, what can we say about the predictions from economic theory and the success of the Mets’ strategy?

□ **Variable pricing and attendance variation.** Exhibit 9 presents descriptive statistics of the number of tickets sold for the Upper Reserved section, both before and after variable pricing was introduced. As can be seen the variance in number of tickets sold remained essentially the same in spite of variable pricing and the prediction from economic theory.

In order to get a better idea of what is happening to variability of attendance, Exhibit 10 shows a series of ratios: the left panel shows attendance ratios by quartile, the right panel price ratios by quartile. For example, in 2001 the top 25% games (by attendance) sold 92% more than the average game (thus the multiplier 1.92). A similar pattern can be observed not only for 2002 but also for 2003 and 2004. In other words, the data does not seem to support the prediction that variable pricing leads to lower variation in attendance levels.

If we consider the classification of games by tier, however, then we get a different picture. This can be seen from the bottom portion of the left-hand panel in Exhibit 10. In 2003, the average “gold” game only sold 25% more than the average game (18% in 2004). In other words, the difference in attendance between gold games and value games is much lower than the difference between the top and bottom attendance games. This can mean that the difference in prices between gold and value games is so great that the order in attendance was reverse. More likely, it means that the Gold/Silver/Bronze/Value classification does not track demand perfectly. We will come back to this later.

□ **Assigning games to tiers.** The independent variables in the demand regression described in Exhibit 11, in addition to all taking values of 0 and 1, all correspond to information that is available to the Mets at the beginning of the season. This leads to an interesting question: based on the information from the regression analysis, was the assignment of games to each of the tiers optimal? How different an assignment would one make taking into account the regression results?

A first answer to this question is given by Exhibit 13. The horizontal axis plots the predicted number of ticket sales based on the statistical model and the information available at the beginning of the season. The vertical axis plots actual number of tickets sold. The main diagonal represents points such that predicted sales equal actual sales. A sign of a good fit is for many points to be located close to the main diagonal.

First notice there is a small set of points close to the upper right corner of the graph. These correspond to Yankees games. First notice that Yankees games are close to the diagonal, meaning that the model does a good job at predicting demand (full house). Second, all of these games are classified as Gold (●), which suggests that allocation is correct (if somewhat obvious).

Other than the Yankee games, we notice that the variation in actual attendance is considerably greater than the variation in predicted attendance. This reinforces the point that the statistical model is only explaining a fraction of the total variation. Moreover, the various tier signs are all more or less mixed up, both horizontally and vertically. Specifically, there are many Gold games (●) located at the bottom of the pile (low actual ticket sales) as well as at the left of the pile (low predicted sales).

□ **Is there a labeling effect?** One tantalizing possibility is that the mere assignment of a game to a given tier influences demand beyond what the game’s characteristics would imply (opponent, time of day, etc). There are at least two reasons why such a signalling effect might be at work. First, fans who are unaware of the quality of the game (e.g., tourists) may take tier assignment as a signal of game quality and adjust demand accordingly. Second, to the extent that the fun of watching a game depend on how many other people watch the game, tier assignment may serve as a “coordination” device: fans avoid Value games because they expect other fans to avoid such games.

In order to explore the possibility of such signalling and coordination effects, we compare actual demand with predicted demand based on observable characteristics. By grouping games by tier we are then able to test whether there is a tier effect at work. Exhibit 14 presents the results. First, we compute predicted demand based on the model used to produce Exhibit 11 (that is, without considering price effects. Next, we consider the effect of price to be uniformly captured by the demand elasticity  $\epsilon = -.35$  estimated from the 2004 “experiment.” Finally, we rescale all values such that average attendance matches the actual observed values.

The results are somewhat inconclusive. Actual attendance at Value games is considerably lower than the model predicts, suggesting that there may indeed be a signaling effect (that is, being labeled a Value game reduces demand, everything else constant). Notice that the same is true for the opposite tier, Gold. However, the difference is much smaller. Moreover, one explanation for the difference is that capacity constraints are active in many of the Gold games (that is, demand is greater than actual sales). Regarding Silver and Bronze games, the difference between predicted and actual attendance is contrary to what a signaling theory would predict. In fact, if the theory were true than the results suggest that Silver is a negative signal, whereas Bronze is a positive signal. In any event, it is well to recall that the statistical model only accounts for a little less than one half of the total variation.

### **The jury's still out**

During the 2002 season, the Mets raised \$87 million dollars in ticket sales. The next season, the first season with variable pricing, the same figure dropped to \$78 million. Admittedly, the relevant comparison would be \$78 million versus the 2003 total had the Mets stuck to their previous strategy. Still, the early experience does not bode well for variable pricing. However, sports and economics experts such as Dan Migala, executive editor of Team Marketing Report, are optimistic. "I think it's the wave of the future because it makes economic sense. It maximizes revenues yet it doesn't alienate fans who don't have a huge wallet to draw upon. In years past, you saw price increases running across the board, but now there's a lot more sophistication."<sup>2</sup>

### **Update**

In 2005, the Mets continued tweaking with its pricing structure, this time adding a fifth tier, "platinum." "Opening Day, the Yankee games, we could get basically any price we want for those," said Dan DeMato, director of ticket operations. He added that "we're leaving money on the table if we don't," and "we look at this the same way as the scalpers and brokers and eBay are looking at it."<sup>6</sup>

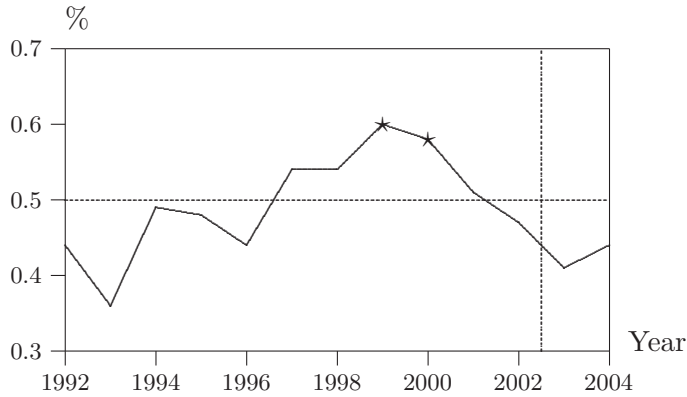
As of 2009, about half of Major League Baseball's teams have some form of variable pricing.<sup>7</sup> The New York Yankees are one of the hold-out teams. "People come to see the Yankees and not the visiting club," said a spokesperson, adding that "they want to see [new] the stadium too. It's just a different view."<sup>7</sup>

### **Dynamic pricing at the San Francisco Giants**

The Giants are the first Major League Baseball team to institute a dynamic pricing structure, which continually readjusts ticket prices up to the morning of a game, based on market demand. Dynamic pricing adjusts ticket prices based on the unforeseen factors that could increase or decrease demand for a specific game. Some examples of these factors include team performance, the starting pitcher(s), promotional giveaways or an opponents' team performance.

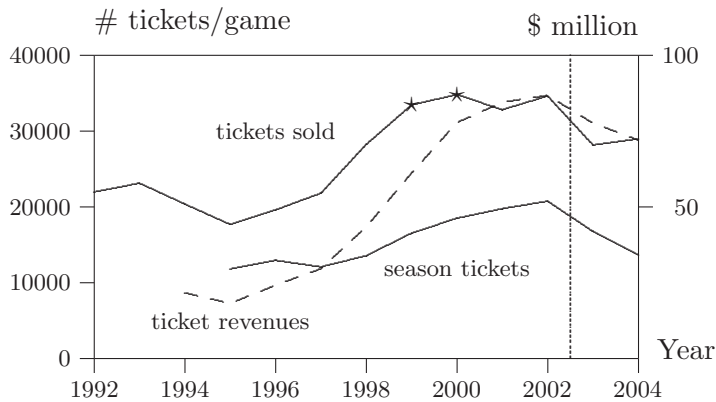
**Exhibit 1**

The New York Mets performance on the field: Winning percentage. Stars indicate seasons when the Mets made it to post-season play. A vertical dotted line indicates the introduction of variable pricing. Source: mbl.com



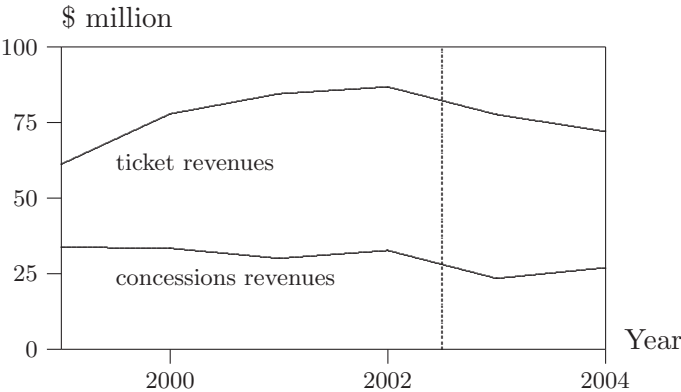
**Exhibit 2**

The New York Mets performance at the ticket office: Average game attendance and season tickets (together with packs and plans), 1992–2004 (solid lines, left-hand scale); and total ticket sales revenue (dashed line, right-hand scale). Stars indicate seasons when the Mets made it to post-season play. A vertical dotted line indicates the introduction of variable pricing. Sources: baseball-almanac.com and New York Mets



**Exhibit 3**

Ticket revenues and concessions revenue. Source: New York Mets



**Exhibit 4**

2004 concessions by type. Source: New York Mets.

Concept	Value (\$m)	Percentage
Concessions	17.3	64
Merchandise	4.2	16
Catering	4.1	15
Concession (subcont)	1.4	5
Total	27.0	100

Exhibit 5  
Shea stadium seating.



**Exhibit 6**

Prices before and after the introduction of variable pricing (\$/ticket).

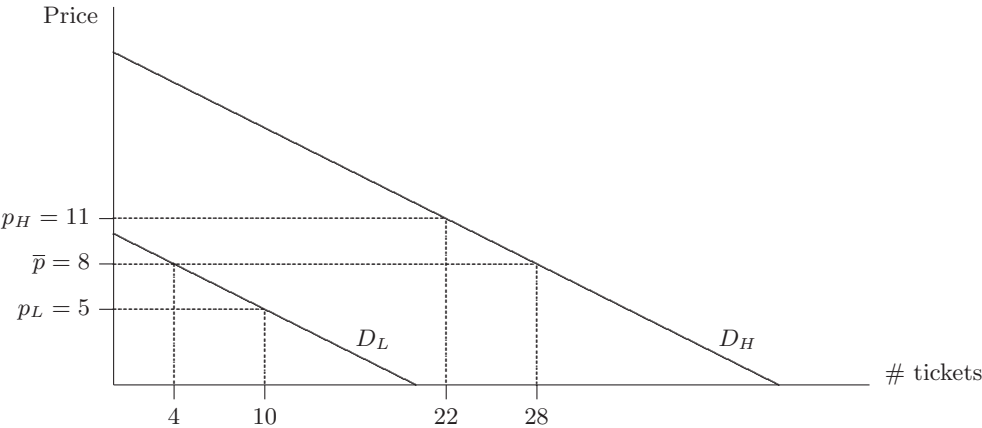
Seating Area	2003–04				2001–02
	Gold	Silver	Bronze	Value	
HP Club Gold	215	205	195	185	195
HP Club Silver	161	153	145	137	145
Baseline Club	161	153	145	137	145
Metro Club Gold	76	70	64	58	64
Baseline Inner	76	70	64	58	64
Metro Club	72	66	60	54	60
Press Level Club	72	66	60	54	60
DVS	72	66	60	54	60
Hcap — HP Club	72	66	60	54	60
Inner Field	53	48	43	38	43
Inner Loge Box	53	48	43	38	43
Baseline Outer	53	48	43	38	43
Middle Field Box	46	42	38	34	38
Mezzanine Box	39	36	33	30	33
Outer Field	39	36	33	30	33
Outer Loge Box	39	36	33	30	33
Press Box	36	33	30	27	30
Loge Reserved	33	31	29	27	29
Picnic Area	32	30	28	26	28
Hcap — Field	27	25	23	19	23
Mezzanine Reserved	27	25	23	19	23
Upper Box	27	25	23	19	23
Loge Reserved, Back Rows*	16	14	12	8/5	12
Mezzanine Reserved, Back Rows*†	16	14	12	8/5	12/11
Upper Reserved*	16	14	12	8/5	9
Hcap — OF	14	12	10	8/5	10

\* The price of value games in 2003 was \$8 and in 2004 was \$5.

† The price was 12 in 2002 and 11 in 2001.

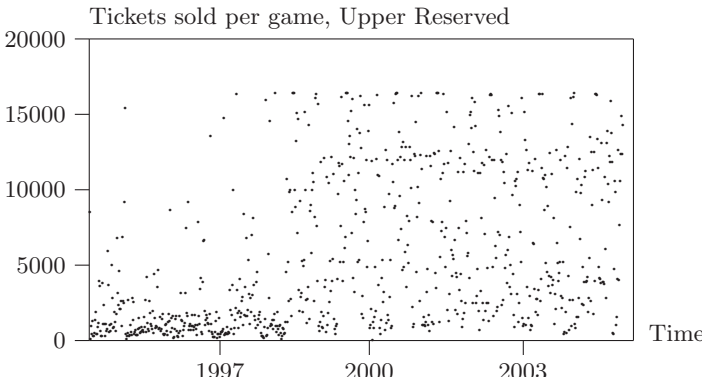
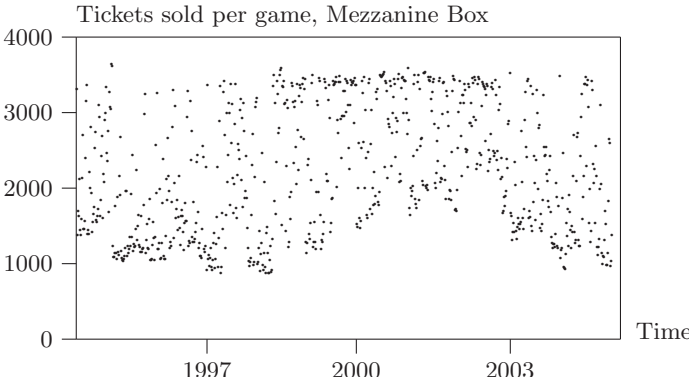
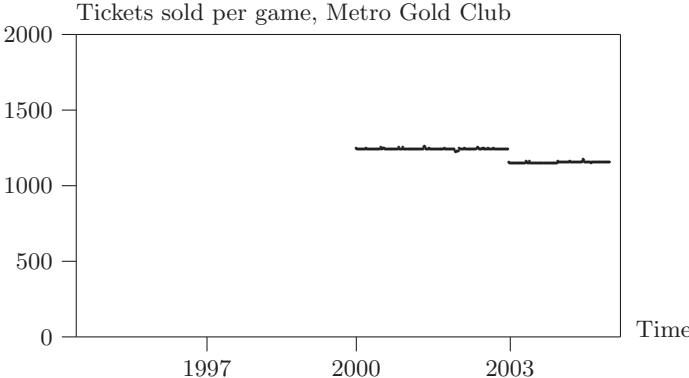
**Exhibit 7**

Variable pricing, demand and revenue.



**Exhibit 8**

Attendance by game and selected seating sections.



**Exhibit 9**

Upper Reserved section ticket sales (1994–2002). Descriptive statistics.

Period	# obs.	Mean	Std Dev	Min	Max
1994–2004	804	5420.6	5079.9	0	16356
2001–2002	156	7444.8	4983.2	582	16355
2003–2004	153	7154.6	5011.2	364	16356

**Exhibit 10**

Attendance and price ratios, Upper Reserved section. Each cell indicates the ratio between the group average and the year average. For example the Gold attendance ratio 1.25 means that the average Gold game sold 25% more tickets than the average 2003 game. Q1, Q2, . . . , denotes top quartile, second quartile, etc. Source: New York Mets.

Attendance ratios				
	2001	2002	2003	2004
Q1	1.92	1.86	2.11	1.79
Q2	1.25	1.31	1.18	1.34
Q3	0.60	0.62	0.53	0.60
Q4	0.18	0.25	0.19	0.23
Gold			1.25	1.18
Silver			0.88	0.85
Bronze			1.03	1.07
Value			0.83	0.89

Price ratios				
	2001	2002	2003	2004
Q1	1.00	1.00	0.99	1.08
Q2	1.00	1.00	1.03	0.90
Q3	1.00	1.00	1.06	1.10
Q4	1.00	1.00	0.92	0.92
Gold			1.27	1.33
Silver			1.11	1.16
Bronze			0.95	1.00
Value			0.64	0.42

**Exhibit 11**

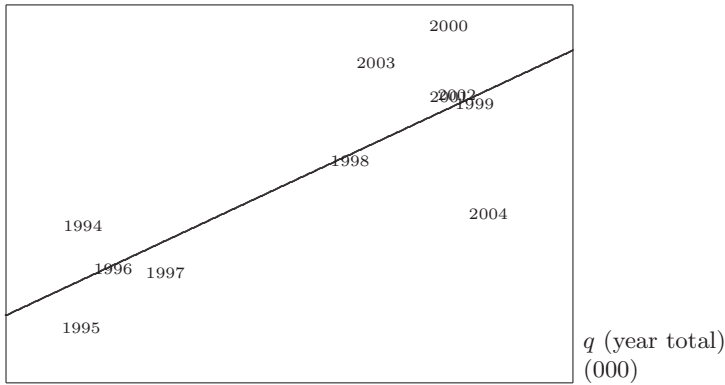
Upper Reserved section ticket sales (1994–2002). Regression analysis.

Dependent variable: Attendance				
Explanatory variables	Coef.	Std. Err.	$z$	$P >  z $
Weekend	1078.63	402.30	2.68	0.01
Evening	-905.58	391.22	-2.31	0.02
Season opener	8196.82	1373.29	5.97	0.00
July	2410.27	411.06	5.86	0.00
August	1425.13	415.89	3.43	0.00
September	1555.44	464.04	3.35	0.00
October	3774.67	1176.42	3.21	0.00
Yankees	9169.82	1002.20	9.15	0.00
Constant	401.53	634.74	2.21	0.03

Year dummies included.  $N = 651$ .  $\bar{R}^2 = 0.44$

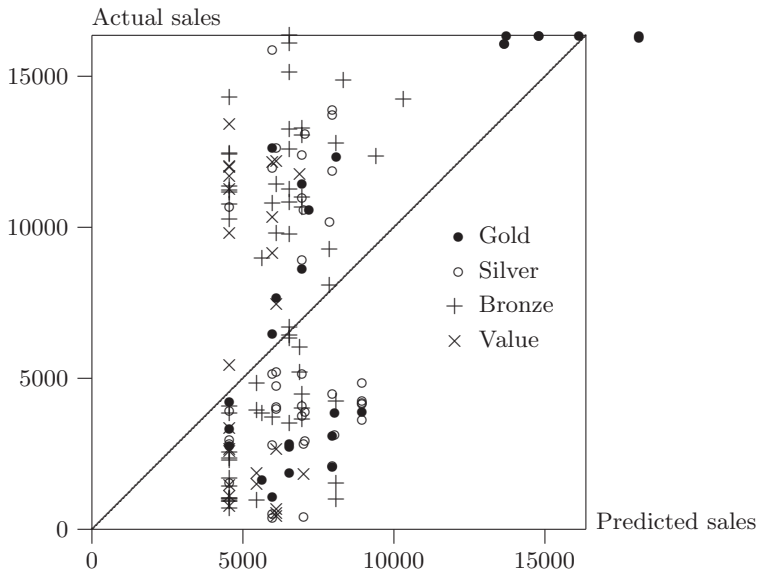
**Exhibit 12**

Upper Reserved section: average price and annual sales, 1994–2004.

 $p$  (\$)

**Exhibit 13**

Upper Reserved ticket sales (2003–2004): predicted and observed.



**Exhibit 14**

Upper Reserved section ticket sales per game (2003–2004). Predicted and observed values.

Tier	# obs.	Predicted		Actual
		$\epsilon = 0$	$\epsilon = -.35$	
Gold	27	9815	8907	8610
Silver	40	7307	6947	6192
Bronze	60	6489	6510	7572
Value	26	5693	7141	6161
All tiers	153	7155	7155	7155

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**Endotes**

1. Robert H. Frank, "Pricing the Ballgame," *New York Times*, December 4, 2002.
2. Richard Sandomir, "Mets Offer Ticket Prices To Suit Every Occasion," *The New York Times*, November 27, 2002.
3. King, Bill. "Battle for the New York Sports Fan." *Sports Business Journal*, October 11, 2004.
4. "That's the Ticket," *Minneapolis/St. Paul Business Journal*, April 7, 2006.
5. Phil Miller, "Premium Ticket Pricing," [thesportseconomist.com](http://thesportseconomist.com), June 10, 2005.
6. Mike Barnes, "Turnstiles: Ticket Trends Observed from the Seat of One's Pants," *Amusement Business*, February 14, 2005.
7. Rick Rosso, "New York Mets Add More Premium-Priced Games to Their Slate," *Ticket News*, April 8th, 2009.