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Testing the Existence of Reputational Capital Among Major League Baseball Teams

Stuart Towne
Western Kentucky University

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Towne,

Stuart Glen

1990
TESTING THE EXISTENCE OF 
REPUTATIONAL CAPITAL 
AMONG MAJOR LEAGUE BASEBALL TEAMS

A Thesis
Presented to
the Faculty of the Department of Economics
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by
Stuart Glen Towne
November 26, 1990
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TESTING THE EXISTENCE OF REPUTATIONAL CAPITAL AMONG MAJOR LEAGUE BASEBALL TEAMS

DATE RECOMMENDED November 29, 1990

DIRECTOR OF THESIS

DATE APPROVED December 12, 1990

DEAN OF THE GRADUATE COLLEGE
The purpose of this thesis is to demonstrate the existence of reputational capital among Major League Baseball teams.

Previous studies have shown that there is a strong relationship between past performance and current attendance at professional baseball games. Using reputational capital as an explanation, this paper provides a general discussion of this relationship.

The discussion of reputational capital is followed by an empirical analysis which includes several model specifications designed to show the effects of past performance on current attendance. One series of models uses cross-sectional data to measure the effects in general across the league and another series of models uses time series data to show some specific examples and how the relationship holds up through time.

The results of the empirical study show that there is generally a strong relationship between past
performance and current attendance, although from
team-to-team the magnitude of the effect varies. Con-
sistent with economic and marketing theory, the re-
sults show that baseball teams accumulate and deplete
reputational capital.
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INTRODUCTION

Companies that market consumer products build a reputation by producing quality products through time. This reputation is in itself an intangible form of capital which theoretically should have some effect on the final demand for the product. Brand names like International Business Machines, Mercedes Benz, and Tylenol are instantly identified with quality due to their past effectiveness and to some extent their advertising.

The purpose of this paper is to demonstrate the existence of reputational capital with Major League Baseball teams. There will be a general discussion of reputational capital and how it applies to various products. An empirical analysis will follow, which quantifies the relationship between reputation and demand. This study offers a significant contribution to the field of sports attendance analysis by combining econometric analysis with marketing theory to explain not only how baseball demand changes with changes in winning percentage, but why those changes occur.

PREVIOUS LITERATURE

The economic literature in the field of sports
attendance is relatively small, but is continually growing. Roger Noll’s *Government and the Sports Business* (1974), Gerald Scully’s *The Business of Major League Baseball* (1984), and James Whitney’s “Winning Games Versus Winning Championships: The Economics of Fan Interest and Team Performance” (1988) provide a solid background on the subject. The intention of this thesis is to explain some of the previous works using reputation as a hypothesis and to update other works using the most recent data available.

The two prevalent theories are that baseball attendance is directly related to either: a) current and previous season winning percentage (Noll (1974), Scully (1984), Medoff (1976)); or, b) championship prospects (Whitney (1988) Rottenberg (1956)). Although the two are closely related, they are not the same since a team may have quite a good winning percentage, but no realistic chance at winning a pennant due to the somewhat higher quality of another team in the same division.

This paper will attempt to show the effects of reputation on attendance; thus, proxying reputation becomes a principal concern. There are numerous different measures available, but most relevant will be either the previous season winning percentage or a
moving average of several previous seasons. Prior to the start of a season past records and off-season acquisitions are the only information fans have to judge quality in the forthcoming season. Given the fact that a team's winning percentage will fluctuate throughout the season, we also have the interesting case of current winning percentage, which at once measures both reputation and current quality.

**THE CASE OF REPUTATIONAL CAPITAL**

Reputational capital could probably best be defined as an intangible asset that results from previous product quality. An important note here is that the reputational capital referred to here is not the same as reputational capital derived from advertising. Clearly there is a difference in the reputation earned from producing a quality product year after year and that earned by having a sports celebrity say, "This is a great product," although in some cases they may produce comparable increases in demand.

Often firms will use their achievements as a part of an advertising campaign. For example auto ads will frequently refer to industry surveys and product reviews to attest to previous and present quality. This makes it difficult to know just what is and what is not a quality product. Baseball, on the other hand,
has no such problems if we judge quality by winning percentage. It would be difficult for a team with a low winning percentage to claim to be a quality team when anyone can look at the daily paper and find out just the opposite. Therefore, in determining reputation derived from actual quality, a prime criterion would be the objectivity of the major source of product information. For many products the major source of product information is advertising, whereas with baseball the primary source of information will be televised games, the daily newspaper and other sports publications which report current statistics.

THE EFFECTS OF REPUTATIONAL CAPITAL

To demonstrate the theoretical effects of reputational capital we can look at a hypothetical auto industry. For example, we have two new automobiles, both cars are stylistically and mechanically identical. The only difference is that CAR A has been produced for ten consecutive years with a very high record of reliability and CAR B is entering its first year on the market. If both cars were priced identically, it would be highly likely that CAR A would sell better. The reverse can also be shown as well (ie. if CAR A had a historically poor reliability record, we would predict CAR B to sell better).
In essence, what reputational capital does is shift a product's demand curve either to the right (good reputation) or to the left (poor reputation). Figure 1 shows that at time A an automaker builds a quality car, which shifts the demand curve at time B to the right. This occurs because people obtain information from sources such as customer satisfaction surveys, auto magazines, and word of mouth which leads them to believe that this is a quality car.

At time B the automaker again builds a quality car, which shifts the demand curve at time C to the right. At time C, the automaker builds a poor quality car, which shifts the demand curve at time D to the left. Restated, at every level of price we would purchase fewer cars at time D than in time C.

EMPIRICAL FACTORS CONSIDERED

Professional sports lend themselves readily to this type of analysis as a specific and easily identifiable measure of quality exists. Unlike the case of an auto industry, there is not a reliance on proxying subjective variables such as comfort, styling, or some other utility-bearing attribute. Hedonic pricing models and time allocation theory do, however, allow for the empirical inclusion of such attributes. For baseball this would involve viewing the baseball game as a
FIGURE I: CHANGES IN DEMAND FOR A HYPOTHETICAL AUTO MANUFACTURER
bundle of amenities and costs. For example, there would be utility gained from the excitement of the game and the time spent with family or friends, and there would be opportunity costs involved since going to a baseball game usually consumes a great deal of time with transportation, planning, and the game itself. For the purposes of explaining and empirically demonstrating the effects of reputation on demand, however, a less complex model should suffice.

Here we will express demand for baseball such that:

\[ BD=f(P,I,p,Q,R,S,pS,o) \]

where \( BD \) = Yearly total attendance, \( P \) = population, \( I \) = income, \( p \) = price, \( Q \) = quality, \( R \) = reputation, \( S \) = substitutes, \( pS \) = price of substitutes, and \( o \) = other unspecified factors.

Population will have a positive effect on demand for baseball. Logically, if all other factors are held equal we would expect a higher level of attendance in Los Angeles than in Cincinnati. Scully (1984) found that, holding ticket price and team quality constant, an extra one million in population results in approximately 180,000 in additional season attendance.\(^1\) The definition of population would best be specified using the Standard Metropolitan Statisti-
cal Area surrounding the baseball team's location.

We would expect baseball to be a normal good and thus expect the income relationship to be positive.\textsuperscript{2} We would also expect price to have a negative effect on attendance given the traditional price/demand relationship.

Product quality should have the most dominant effect on attendance. Current product quality is best measured as season-winning percentage, although an alternative would be to use the number of games behind the division leader. Reputation, as mentioned before, can be specified in numerous ways including the previous season-winning percentage, the mean-winning percentage of $x$ number of previous seasons, or mean number of games behind the leader for $x$ number of previous seasons, to name a few.

Substitute activities and the prices of those activities would likely have only a small effect on seasonal attendance because there are so few products that are either perfect substitutes or closely related substitutes. It can also be argued that there is no substitute for a night at the ballpark!

Other unspecified factors would probably include some of the hedonic variables and time allocation variables discussed earlier. This would include the many
compliments to baseball consumption, such as quality of the food at the stadium, convenience and costs of parking facilities, aesthetic appeal of the stadium, etc., generally things that will have some affect on attendance, but would not fall into any of the traditional categories.

APPLICATIONS TO MAJOR LEAGUE BASEBALL

For any given team in any given season the supply of baseball seats is basically fixed - constrained by the size of the stadium. Given this, we observe the vertical supply curve shown in Figure 2. The demand curve for baseball seats shown in Figure 2 is the traditional negatively sloped one. Baseball is a very interesting case, however, in that as far as seats available are concerned supply virtually never actually equals demand. Unlike other products, baseball teams do not have the luxury of easily cutting back or stepping up production when demand changes. Since nominal ticket price is usually fixed throughout the season, this means that we always have a surplus or a shortage of baseball seats. 3 Time A on Figure 2 shows the normal situation during the season. At the given price there is a surplus of seats, which is expressed by the equation: Surplus = S - Ad.

Time B, however, shows a situation late in the
FIGURE 2: Typical game-by-game supply of seats and demand for seats at Major League Baseball games.
season when a team is in the middle of a pennant race. The demand curve has shifted to the right far enough so that at current ticket prices, which are set prior to the start of the season, demand actually exceeds supply and there is a shortage of seats, which can be expressed by the equation: Shortage = S - Bd.

Time C, shows what might be the typical situation during the divisional playoffs or the World Series—where ticket prices are somewhat higher. The demand curve has again shifted to the right, but there has been an increase in prices. In this situation we again have a shortage, but the shortage is only given by $S-C$ rather than $S-D$.

TRADITIONAL MARKETING THEORY

Traditional marketing theory tells us that events change the probability of purchasing a product and that each time one purchases a product it increases the probability that one will purchase it again in the future. Noll (1974) estimates that roughly 10 to 20 percent of total season attendance is made up of separate individuals, which shows that much of the total attendance is made up of individuals who go to numerous games. Other events that may lead to tickets being purchased are the growth in the number of televised games, newspaper articles about the team, and word of
mouth, each of which will be related to winning percentage or winning prospects.

Given all the different information people obtain about baseball teams, traditional marketing analysis can again be used to develop the notion of a team’s reputation. Levy (1978) notes that image includes four principal factors:

1) Knowledge of technical matters
2) Awareness of other product characteristics
3) Beliefs about the value of the object
4) Judgments about the suitability of the brand

A knowledge of technical matters would include how well people interpret the team statistics and individual statistics of various players on a particular team. An awareness of other product characteristics would be an awareness of the quality of individual players which tends to subjective, but is often interpreted as fact. Beliefs about the value of the object would essentially come down to the individual’s utility function and how highly a person values the "experience" of attending the baseball game, measured against cost considerations such as beer, food, parking, souvenirs, tickets, gasoline and time. Suitability of the brand would most likely involve geographic considerations. In other words an individual living in Akron would probably go see a Cleveland Indians game played in Cleveland rather than a game played in
EMPIRICAL ANALYSIS

Several model specifications were used to quantify the relationship between reputation, as measured by past performance, and demand for baseball. In the first series of models, cross-sectional data are used to estimate the effects of reputation. In the second series of models, time series data are used for several teams to quantify the effects of reputation through time for those selected cities.

Model 1 is cross-sectional, using 1990 data from 24 of the 26 major league cities, Montreal and Toronto excluded. I estimated the following equation using ordinary least squares:

\[ \text{Attend} = B_1 + B_2 \text{Wp}_t + B_3 \text{Wp}_{t-1} + B_4 \text{Employ}_t + \epsilon_t \]

where \( \text{Attend} = \) Total season attendance

\( \text{Wp} = \) Winning Percentage

\( \text{Employ} = \) Employees on non-agricultural payrolls

Model 2 is an expansion specified:

\[ \text{Attend} = B_1 + B_2 \text{Deal}_t + B_3 \text{Wp}_{t-1} + B_4 \text{Employ}_t + B_5 \text{DT}_t + \epsilon \]

where \( \text{Deal} = \) Ticket Price/\text{Wp}_t
DT = dummy variable
1 if two or more division titles
in the past five years
0 if less than two division
titles in the past five years

Attend, WP, and Employ are the same as in Model 1.

Model 2 is theoretically more appealing in that it adjusts current quality for price discrepancies and, due to the dummy, provides an additional measure of reputation. The dummy is appropriate in this situation because a team that won championships recently within the past five years may experience expanded attendance that cannot be accounted for in the previous season’s winning percentage. Scully (1984) estimated a similar model, excluding the dummy variable and using population instead of employment, with similar results (See Table 1).

All but the noted coefficients are significant at the 90 percent level and all have the expected signs. Using Model 1 in the log-linear format, the estimated elasticity of demand with respect to winning percentage is 1.11 and the elasticity of demand with respect to the previous season winning percentage is 1.16. In neither case can we reject unitary elasticity. In other words a 10 percent increase in either this season’s attendance or the previous season’s attendance should result in roughly a 10 percent increase in at-
<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Scully</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-2328.12 (-2.81)</td>
<td>580.87 (.77)*</td>
<td>947.90 NR</td>
</tr>
<tr>
<td>WP-Deal</td>
<td>3926.21 (2.99)</td>
<td>-63.60 (-2.10)</td>
<td>-101.91 NR</td>
</tr>
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<td>WPt-1</td>
<td>4357.03 (3.49)</td>
<td>4191.77 (3.01)</td>
<td>3026.09 NR</td>
</tr>
<tr>
<td>Employ</td>
<td>.15 (2.41)</td>
<td>.18 (2.40)</td>
<td>.19 NR</td>
</tr>
<tr>
<td>DT</td>
<td>-</td>
<td>401.47 (2.07)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>24</td>
<td>24</td>
<td>26</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.54</td>
<td>.55</td>
<td>.62</td>
</tr>
<tr>
<td>F</td>
<td>10.05</td>
<td>7.97</td>
<td>NR</td>
</tr>
<tr>
<td>Durbin-Watson</td>
<td>2.45</td>
<td>1.92</td>
<td>NR</td>
</tr>
</tbody>
</table>

* Not significant at 90% level  
NR=Not reported
tendance.

Model 2, which has approximately the same coefficient for previous winning percentage, shows that teams that won two or more division championships in the past five years draw approximately 420,030 more in attendance than had they not. Or stated another way, there will be a rightward shift in the demand curve of about 420,030 at every level of price.

The next series of models uses time series data from 1947 to 1990 for Cleveland, Cincinnati, New York (Yankees), Pittsburgh, Philadelphia, and Boston. For the three national league cities, Cincinnati, Pittsburgh, and Philadelphia, the models are specified as the following:

\[
\text{Attend} = B_1 + B_2 \text{ WP}_t + B_3 \text{ WP}_{t-1} + B_4 \text{ Age}_t + B_5 \text{ Strk} + B_6 \text{ Time}_t + e
\]

where

- \( \text{Attend} \) = Total season attendance
- \( \text{WP} \) = Season winning percentage
- \( \text{Age} \) = Proxy for stadium age: series begins at one in 1947 and increases by one each season until the year a new stadium is introduced and then again increases by one every season
- \( \text{Strk} \) = Dummy variable to account for the strike in 1981
- \( \text{Time} \) = Linear time trend series beginning at one in 1947 and ending at 44 in 1990
For the remaining American League cities the models are specified as follows:

\[ \text{Attend} = B_1 + B_2 \text{ WP}_t + B_3 \text{ WP}_{t-1} + B_4 \text{ Strkt}_t + B_5 \text{ Time} + e \]

There will be no stadium effects reported for the American League teams since none of the three teams introduced a new stadium, although Yankee stadium did undergo some improvements in 1975 and 1976.

Along with these specifications is an alternative specification that substitutes a four-year moving average winning percentage in place of the winning percentage for the previous one season. This alternative should give some insight into the question of whether fans put more emphasis on the "organization" or if they simply make the decision to attend games based on current expectations of winning. If a team has a tradition of winning, current attendance might be better estimated by using a variable which takes this past success into consideration.

Table 2 data show the regression results for the three National League cities and Table 3 data show results for American League cities. For each city, model 1 uses previous season attendance and model 2 uses the four-year moving average winning percentage.

In all of the time series models the Cochrane-
### Table 2: National League Sample: 1953-1990

<table>
<thead>
<tr>
<th></th>
<th>Cincinnati 1</th>
<th>Cincinnati 2</th>
<th>Philadelphia 1</th>
<th>Philadelphia 2</th>
<th>Pittsburgh 1</th>
<th>Pittsburgh 2</th>
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<tbody>
<tr>
<td>Constant</td>
<td>-1828.96</td>
<td>-4573.33</td>
<td>-803.76</td>
<td>-1474.79</td>
<td>-1777.83</td>
<td>-58.84</td>
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<tr>
<td></td>
<td>(-2.87)</td>
<td>(-3.79)</td>
<td>(-1.82)*</td>
<td>(-2.41)</td>
<td>(-2.11)</td>
<td>(-.14)*</td>
</tr>
<tr>
<td>WP</td>
<td>3197.95</td>
<td>3590.49</td>
<td>2370.30</td>
<td>2582.32</td>
<td>3385.43</td>
<td>3342.55</td>
</tr>
<tr>
<td></td>
<td>(5.66)</td>
<td>(6.97)</td>
<td>(4.67)</td>
<td>(5.13)</td>
<td>(5.25)</td>
<td>(5.03)</td>
</tr>
<tr>
<td>PrevWP</td>
<td>1142.70</td>
<td>5446.47</td>
<td>1036.48</td>
<td>2475.64</td>
<td>1395.36</td>
<td>1650.25</td>
</tr>
<tr>
<td></td>
<td>(2.21)</td>
<td>(3.72)</td>
<td>(2.07)</td>
<td>(2.43)</td>
<td>(2.27)</td>
<td>(-1.87)*</td>
</tr>
<tr>
<td>Age</td>
<td>-22.57</td>
<td>-20.84</td>
<td>-35.99</td>
<td>-41.14</td>
<td>-16.05</td>
<td>-8.64</td>
</tr>
<tr>
<td></td>
<td>(-2.57)</td>
<td>(-2.64)</td>
<td>(-4.92)</td>
<td>(-5.86)</td>
<td>(-1.48)*</td>
<td>(-1.02)*</td>
</tr>
<tr>
<td>Strike</td>
<td>-1018.45</td>
<td>-1015.19</td>
<td>-879.24</td>
<td>-858.81</td>
<td>-555.69</td>
<td>-506.17</td>
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<tr>
<td></td>
<td>(-6.12)</td>
<td>(-7.10)</td>
<td>(-6.61)</td>
<td>(-6.62)</td>
<td>(-3.00)</td>
<td>(-2.02)</td>
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<tr>
<td>Time</td>
<td>49.59</td>
<td>55.06</td>
<td>44.78</td>
<td>42.14</td>
<td>25.64</td>
<td>16.20</td>
</tr>
<tr>
<td></td>
<td>(4.89)</td>
<td>(3.17)</td>
<td>(4.94)</td>
<td>(5.12)</td>
<td>(1.29)*</td>
<td>(2.85)</td>
</tr>
<tr>
<td>Rho</td>
<td>.71</td>
<td>.81</td>
<td>.73</td>
<td>.70</td>
<td>.78</td>
<td>.30</td>
</tr>
<tr>
<td>Estimate</td>
<td>(5.51)</td>
<td>(8.19)</td>
<td>(6.02)</td>
<td>(5.89)</td>
<td>(5.76)</td>
<td>(1.61)*</td>
</tr>
<tr>
<td>N</td>
<td>38</td>
<td>38</td>
<td>38</td>
<td>38</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.92</td>
<td>.94</td>
<td>.94</td>
<td>.95</td>
<td>.64</td>
<td>.62</td>
</tr>
<tr>
<td>F</td>
<td>75.47</td>
<td>90.83</td>
<td>105.18</td>
<td>110.52</td>
<td>11.97</td>
<td>10.91</td>
</tr>
</tbody>
</table>

*Insignificant at the 90% level*
TABLE 3 American League Sample: 1953-1990

<table>
<thead>
<tr>
<th></th>
<th>Boston</th>
<th>Cleveland</th>
<th>New York</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Constant</td>
<td>$-2106.38$ ((-4.11))</td>
<td>$-1738.79$ ((-2.07))</td>
<td>$-696.71$ ((-0.94))</td>
</tr>
<tr>
<td>WP</td>
<td>3078.40 ((4.92))</td>
<td>3489.10 ((7.08))</td>
<td>3324.47 ((6.51))</td>
</tr>
<tr>
<td>PrevWP</td>
<td>2309.82 ((3.72))</td>
<td>839.46 ((1.71))</td>
<td>318.18 ((.32))</td>
</tr>
<tr>
<td>Strike</td>
<td>$-854.83$ ((-5.92))</td>
<td>$-643.24$ ((-4.12))</td>
<td>$-626.53$ ((-3.85))</td>
</tr>
<tr>
<td>Time</td>
<td>34.89 ((5.92))</td>
<td>21.17 ((5.03))</td>
<td>18.68 ((3.47))</td>
</tr>
<tr>
<td>Rho</td>
<td>.56</td>
<td>.27</td>
<td>.25</td>
</tr>
<tr>
<td>Estimate</td>
<td>(3.76)</td>
<td>(1.71)(*)</td>
<td>(1.58)(*)</td>
</tr>
<tr>
<td>N</td>
<td>38</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
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<td>.63</td>
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<tr>
<td>F stat</td>
<td>77.04</td>
<td>53.74</td>
<td>15.11</td>
</tr>
</tbody>
</table>

*Insignificant at the 90% level
Orcutt technique is used to correct for autocorrelation; thus estimated Rho and its t statistics are reported with the other relevant summary statistics. The regression results are interesting in that some of the teams performed extremely well, while others were only marginally successful. For Pittsburgh, Cleveland, and Boston, results were better when using Model 1, while Model 2 performed better for Cincinnati, New York, and Philadelphia. These three teams are probably good examples of teams with strong "organizational" followings, particularly in the cases of Cincinnati and New York, where the coefficients for the previous four seasons winning percentage actually exceeds the coefficients for current season winning percentage.

The results for Cincinnati and New York may have something to do with the number of tickets sold on a single game basis, the number of season tickets sold, and the number of business tickets sold. For example, the number of single game tickets sold is likely to be highly influenced by the way the team is currently performing. Season ticket sales, however, which are sold prior to the start of the season, are likely to be influenced by the previous season or several previous seasons. One explanation might be that teams like
Cincinnati and New York sell lower percentages of total ticket sales on a single game basis. In 1984, in fact, these teams did sell a below-average proportion of ticket sales on such a basis.\textsuperscript{10}

Using the log-linear transformation we can again obtain elasticities for each city. Data in Table 4 show that only Boston could be considered unitary elastic with respect to the previous season’s attendance, while Cincinnati, Boston, and New York could be considered unitary elastic with respect to the mean winning percentage for the previous four seasons.

With respect to current season attendance Table 4 data show that Cincinnati, Pittsburgh, Cleveland, and possibly Boston exhibit positive elasticity. In other words, a certain percentage change in current winning percentage will spurn a greater percentage change in total attendance. Philadelphia exhibited unitary elasticity and, interestingly, New York proved to be inelastic.

Table 4 data show that, although these teams generally do not exhibit a one-for-one relationship between previous season winning percentage, or the four-year moving average winning percentage, and attendance, there is a positive relationship. More importantly, these models show the relationship between
<table>
<thead>
<tr>
<th></th>
<th>Elasticity Value</th>
<th>Elasticity Range</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cleveland</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WP #1</td>
<td>1.84</td>
<td>1.59 to 2.09</td>
<td>Elastic</td>
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<tr>
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<td>1.38 to 1.90</td>
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<tr>
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<td>0.60</td>
<td>0.35 to 0.85</td>
<td>Inelastic</td>
</tr>
<tr>
<td>Previous 4 WP</td>
<td>0.36</td>
<td>-0.21 to 0.93</td>
<td>Inelastic</td>
</tr>
<tr>
<td><strong>Cincinnati</strong></td>
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<td>1.15 to 1.53</td>
<td>Elastic</td>
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<tr>
<td>WP #2</td>
<td>1.28</td>
<td>1.08 to 1.48</td>
<td>Elastic</td>
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<tr>
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<td>0.47</td>
<td>0.29 to 0.65</td>
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<tr>
<td>Previous 4 WP</td>
<td>0.84</td>
<td>0.48 to 1.20</td>
<td>Unit Elastic</td>
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<td>-0.80 to -0.06</td>
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<td>0.80 to 1.36</td>
<td>Unit Elastic</td>
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<td>0.68 to 1.14</td>
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<tr>
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<tr>
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<td>-0.17 to 0.25</td>
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<td>0.59 to 1.53</td>
<td>Unit Elastic</td>
</tr>
<tr>
<td><strong>Philadelphia</strong></td>
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<td>Previous 4 WP</td>
<td>0.53</td>
<td>0.17 to 0.89</td>
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past performance and current attendance holds up over time. Taking this into consideration, it is understandable why the results differ so much from city to city considering the many changes that teams undergo over time.

Another interesting point is that in the six time series models only Boston exhibits unitary elasticity with respect to the previous season’s winning percentage, while the cross-sectional model was fairly convincing in showing unitary elasticity on average throughout the league.

CONCLUSIONS

In reviewing the models, it can safely be said that current winning percentage has a very strong impact on attendance levels. In every model it proved to be statistically significant and in every case, except that of New York, either unitary elasticity or positive elasticity is exhibited. This current winning percentage reflects a team’s current reputation for winning on a game-to-game basis and, thus, is most likely to affect single game ticket sales.

The previous season’s winning percentage is a measure of prospects for the current year in that it is the main form of information available. This will likely affect season and business ticket sales since
they are often purchased prior to the season starting. In the cross-sectional model the coefficient actually turned out to be greater for the previous season winning percentage than the current season winning percentage. In the time-series models the effects of the previous season were statistically significant in every case, except those of Cleveland and New York, but were generally inelastic.

The four-year moving average winning percentage would also mainly affect season ticket sales. This variable is designed to measure the reputation that has accumulated through the previous four seasons. In other words, this measures reputation built up over time rather than with current teams. This is due primarily to the fact that individual teams and the rest of the teams in the league are likely to change in terms of talent levels over the course of several seasons. For New York and Cincinnati a unitary elastic relationship was exhibited.

To summarize, it can be said that professional baseball, like most other products, has a reputational factor which increases or decreases product demand with changes in past and present quality. The models specified are consistent with previous works in the field and are consistent with traditional economic and
marketing theory.
NOTES


2 Baseball should be a normal good in the sense that since it is a fairly costly endeavor to go see a baseball game we would expect more games to be attended as income increases. This is, however, an interesting point in that Noll (1974) pp.121 found the coefficient on per capita income to be negative and statistically significant. This may well be a case where at relatively high income levels baseball games lose some of their "normalcy," because baseball is a time intensive endeavor. At higher income levels time is valued more and thus the benefits of going to a game no longer exceed the costs.

3 The actual supply and price of baseball in general are, however, adjusted frequently. Quality-adjusted price may exhibit a great deal of movement throughout a season and owners can alter supply by purchasing or trading for more talent.


5 Scully, 1989, p. 103.


7 Data for baseball winning percentages are from The Sports Encyclopedia: Baseball, by Neft and Cohen and various issues of USA Today. Data for baseball attendances and ticket prices are from the Office of Major League Baseball and various issues of USA Today. Data for employees on non-agricultural payrolls represent the data for June 1990 from the Bureau of Labor Statistics' Employment and Earnings, September 1990. Montreal and Toronto are excluded to avoid exchange rate problems and to maintain continuity in the category of employees on non-agricultural payrolls.

8 Although not perfectly correlated with population, Employees on Non-Agricultural Payrolls will suffice
for the purposes of this study since it gives a good indication of city size.

9 Scully, 1989, p. 115.

10 From Scully, 1989, p. 103. The average percentage of total ticket sales that were for single games in 1984 was 46.5%. For Cincinnati the percentage was 31.8% and 44.4% for New York. Data is from an Ernst and Whitney report to Major League Baseball.
References


