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Introduction

Neale¹ notes that the economics of professional-team-sports is a peculiar economy because the product is the result of the interaction between two teams that produce the match, and eventually of n teams that produce a championship. In the professional sport world, clubs do not necessarily behave as traditional profit

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maximising firms that try to eliminate their competitors to the extent they are allowed by laws that guarantee competition. In professional sports, the most important fact is that spectators decide to attend the matches, and this attendance can be affected not only by the typical economic variables of demand analysis (price and income), but also its characteristics (quality, uncertainty of outcome, etc.). Attendance by fans also requires the participation of the rest of the competitors, to sell the product. Neale expounded this assumption by means of the Louis-Schmelling paradox. In brief, if the heavyweight world champion Joe Louis did not have any rivals, or alternatively, the rivals were not good enough to provide competition, the company “Joe Louis” would not generate profits; the lack of rivals would make it impossible to generate income. On the contrary, rivals of a higher calibre, such as Max Schmelling, would be essential to increase the income of Joe Louis because the high levels of competition would be attractive to spectators. Although Max Schmelling would also obtain profits, for Joe Louis, the quality of the rival would be very important, and would be completely independent of his own skill. This peculiarity of the sports industry was explained by El-Hodiri and Quirk when they pointed out that, on one hand, the teams will try to contract the largest possible amount of talent, to increase the probability of winning all the matches; however, if the team is too successful at maximising winnings, this will compromise the objective of maximising profits, since when the probability of victory is close to one, ticket sales are reduced substantially.

This paper presents a survey of the primarily empirical literature about sporting-events demand (attendance). In section II, the theoretical aspects of demand studies in professional sports is considered, with special reference to the behaviour of clubs as companies and the robustness of the empirical results fitting such theoretical details. Given the mostly empirical approach of the literature, in section III, we place special attention on how demand has been measured and defined, what kind of data have been used and how the equations have been defined. In sections IV through VII, we present in detail the way the different determinants of the demand have been modelled: economic variables (section IV), quality (section V), uncertainty of outcome (section VI) or opportunity cost and other factors (section VII). The article ends with a summary of the main conclusions and future extensions of this literature.

1. Theoretical aspects

Very little literature exists about the theoretical analysis of the demand for sporting events. Most studies focus on two relevant and related questions. The first question involves analysing the behaviour of the clubs as firms. It involves the study of what the objective functions are, namely, which behaviour function should be maximised. With the second question, the researcher seeks to discover if the fixed-
price criterion is compatible with profit maximisation, based on the results reported from the available empirical evidence. A debate emerges because of the repeated observation of price elasticities of demand that are less than one in absolute value. This implies that the ticket prices are fixed in the inelastic range of the demand curve. Such behaviour is contrary to the conditions for profit maximisation for the company in a non-competitive context.

One of the earliest authors to pose the question exploring the specific objectives of sports clubs was Sloane, with special reference to football clubs. To Sloane, clubs maximise a utility function that depends not only on profits, but also on factors like sport success, attendance and competition “health”. Sloane’s argument appears to be quite reasonable, because achieving success in a sport is the most important objective for its supporters. In fact, it will be very difficult for a club to obtain optimal profits if it has a lack of sport success.

In any case, assuming that the clubs do not take into account economic results would be ignoring their role as businesses, which they have a long tradition of being. This is why the most appropriate assumption is to suppose that clubs maximise a utility function which depends, basically, on reaching particular sport successes. It should have at least one restriction, consisting of obtaining a minimum revenue in order to guarantee its viability in the medium and the long run.

Because different profit-maximisation objectives exist, it is possible that some actions taken by the clubs’ owners, like fixing ticket prices, do not follow the behaviour patterns of a profit-maximising company, and the prices are not placed in the elastic range of the demand curve. Price fixing in the inelastic range of the demand curve is the behaviour that different authors have tried to justify, starting from several hypotheses on the topic of profit maximisation. For example, it is supposed that if clubs have stadiums that are never or almost never filled, the marginal cost of a new spectator is almost equal to zero. This means that the price at which the club maximises its benefit is fixed when price elasticity is equal to one.

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4 In the European context, for the teams with the highest budgets that do not participate in any European competition, economic deterioration occurs. In the open league system, this occurs in the same way for the teams that are relegated to inferior divisions.

5 For example, in the case of British football, the acceptance of professionalism goes back to 1885.

6 The possibility of fully completed stadiums makes possible the resale, which is legalised in some cases. See for example A.T. WILLIAMS, *Do Anti-Ticket Scalping Laws Make a Difference?*, in Managerial and Decision Economics, vol. 15, Sep/Oct, 1994, 503-509, or A.C. DE SERPA, *To Err is Rational: A Theory of Excess Demand for Tickets*, in Man. and Dec. Ec., vol. 15, Sep/Oct,
Considering the stadium capacity problem, which is necessarily given alongside the existence of a marginal cost equal zero, for El Hodiri and Quirk profit maximisation is reduced to a problem of maximising revenues in each game, subject to the maximum number of tickets that can be sold. They conclude that if the capacity restriction is not active, the price that maximises benefits is the price corresponding to unit elasticity of the demand curve. If, to the contrary the capacity restriction is active, ticket prices are fixed in the inelastic range of the demand curve.

A second scenario where benefit maximisation is compatible with price elasticity lower than one in absolute value involves the local team directly controlling the stadium license rights for items such as food and drinks. Under this assumption, Heilmann and Wendling demonstrate that if clubs are able to fix the prices lower than their corresponding unit elasticity, they fix prices in the inelastic range. An apparently similar approach to the one presented by Heilmann and Wendling is the one taken by Marburger. Marburger sets up a two-equation model. In the first equation, the dependent variable is demand for tickets, and in the second, concessions is the dependent variable. He demonstrates that if the model does not include the licenses, for a given supply, price fixing would correspond to the unit elasticity point; while, if concessions were included as a complement of the benefit maximisation strategy, ticket prices would fall to the inelastic range of the demand curve.

To Kesenne, the fact that the price elasticity of demand is less than one in absolute value does not mean that clubs do not behave like profit-maximising firms.

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11 A similar result can be found in A. Krautman, D.J. Berri, Can We Find it at the Concessions? Understanding Price Elasticity, in Prof. Sports J. of Sport Ec., vol. 8, n. 2, 2007, 183-191. For them, teams discount ticket prices significantly into the inelastic range of demand when concessions are included in the profit-maximisation model.

One of the arguments supporting this affirmation is that gate revenues are less important to executive managers due to the fact that revenues obtained by tickets sales are lower each time in relation to the total team revenues. Fort\textsuperscript{13} points out that inelastic pricing can happen as a result of profit maximisation if there is a particular relationship between an individual team’s local TV revenues, the marginal cost of talent and the average of the rest of the teams’ local TV revenues.\textsuperscript{14} An argument similar to that of Heilmann and Wendling was used by Brook.\textsuperscript{15} He notes that teams set ticket prices “low”, to capture other revenues sources such as concessions and luxury boxes. In the opinion of Brook, the behaviour of NFL teams is consistent with profit maximisation since estimated marginal non-ticket revenues are greater than the estimated marginal cost of attendance. The same conclusion about setting ticket prices “low” is found by Coates and Humphreys,\textsuperscript{16} who report that franchises set prices in the inelastic portion of demand to maximise concessions’ revenues. Ahn and Lee\textsuperscript{17} show that in a multiple-time-period model, owners set prices in the inelastic range if the intertemporal elasticity of substitution for games is small, and/or if attending games is habit-forming.

In conclusion, as we will see in the next section, the existence of price elasticities of demand lower than one in absolute value is a common feature in the empirical literature. One way to justify this result is to suppose that clubs are not strictly benefit-maximising agents; the other approach tells us that the ticket price is just a part of the total spending of a spectator or family when they go to the stadium to watch a match.

2. Demand definition, data and empirical model

Although other reviews referring to this type of literature\textsuperscript{18} exist, they either do not


make reference to the most recent contributions, they refer to a particular sport or
the specific reference to the analysis of demand is considered in a more general
analysis scenario, so that the detailed approach taken in this research is lost. The
studies that serve as the basis for this review refer to nine professional team sports:
baseball (Major League Baseball, MLB; Japanese Professional Baseball League,
JPBL; and Korean Professional Baseball League, KPBL), American football
(National Football League, NFL), football (soccer), ice hockey (National Hockey
League, NHL), basketball (National Basketball Association, NBA), Australian
football (Australian Football League, AFL), rugby, cricket and horseracing. In
most of the previous review studies, the researchers only make estimations that
follow the standard model of economic theory, with specifications imposed by the
features of the particular professional sport.

The dependent variable evaluated in the studies mentioned in this review is
attendance at sporting events. There is no agreement among the different consulted
studies about how to define the attendance precisely. On one hand, this lack of
agreement is because of the different types of data used, and, on the other hand, it
is due to the different methods of ticket sales depending on the sport and the country.
Accordingly, many studies use panel data, time series (seasons) referenced to cross-
sectional data (matches or teams), in their estimations, so attendance refers to
particular games in the case of matches or the average attendance per season in the
case of the teams. Other studies use time series, so the attendance is referenced to
the yearly average, with heterogeneous lengths of the periods, limiting the effect
analysis to attendance in the short- and long-run of the different explanatory

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Economic Design of Sporting Contests, in The J. of Econ. Lit., vol. 41, n. 4, 2003, 1137-1187,
and R.D. Fort, Y.H. Lee, Stationarity and Major League Baseball Attendance Analysis, in J. of
Sport Ec., vol. 7, n. 4, 2006, 408-415. However, the most completed two surveys were published
in the same year, the ones by J. Borland, R. Macdonald, Demand for Sport, in Ox. Rev. of Ec.
Both studies gather a significant number of works about attendance published up until that date,
describing sports, type of data, years included in the sample, etc. The difference is that Borland
and MacDonald analyse in more detail the uncertainty of outcome variables that the different
authors have used, whereas Garcia and Rodriguez analyse in more detail the economic variables,
especially price and income; this paper does something similar.

19 Analysis referring to individual sports like golf is not reported upon (see L.R. Cottle, Economics
of the Professional Golfers’ Association Tour, in B. Goff, R. Tollison (eds.), Sportometrics,
Texas, Texas A and M University Press, College Station, 1990, 277-291); neither are pseudo-
sport events like rodeo (N. Daneshvary, R. K. Schwer, D.S. Rickman, Determinants of Demand
for Professional Rodeo Attendance, in J. of Cul.Ec., vol. 17, December, 1993, 77-92). However,
some studies about university team sports are included due to their semi-professional character.

20 Sometimes considering the influence of blackouts in TV broadcasts is useful in evaluating
the number of spectators without tickets who do not attend matches. See J.T. Siegfried, C.E.
Hinshaw, The Effect of Lifting Television Blackouts on Professional Football No-Shows, in J. of
Demand for Game-Day Attendance in 1991, in Man. and Dec. Ec., vol. 15, Sep/Oct, 1994, 489-
495; and W.P. Putsis, S.K. Sen, Should NFL blackouts be banned?, in Appl. Ec., vol. 32, n. 12,
2000, 1495-1507, articles.
variables.

Finally, there are studies that use only cross-sectional data referenced to the same season. The type of the data, based on matches or season average, determines the explanatory factors that can be specified and they will be shown subsequently.

Different ticket sales policies make some studies focus their attention, especially due to data availability, on attendance by paying, on attendance by season-ticket holders or on both together. The distinction between standing spectators and seated spectators,\(^{21}\) between club members and the public,\(^{22}\) between local spectators and away spectators\(^{23}\) or between spectators by sex\(^{24}\) or by age\(^{25}\) is not regularly possible because such disaggregated data are not often available to build an analysis of demand up to this level of detail.

Table 1 shows the most important empirical studies with explicit mention of what definition of attendance has been used, as well as the object sport of study and the type of data used.\(^{26}\) These studies have primarily been made in Anglo-Saxon countries, and they are presented in chronological order.


\(^{26}\) In Table 1 are included only the authors that use price as explanatory variable. A more comprehensive table is available at www.rdes.it/RDES_2_09_Villar_Guerrero_table1.pdf
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<th>Author(s)</th>
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<th>Coefficient((\gamma)) Elasticity((\eta)) (Not significant in italics)</th>
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</table>
| Demmert (1973)                   | Baseball USA                        | Seasons (1951-1969). Team.                | a) Seasonal home attendance.                                                        | OLS                | Weighted average price.                     | a) \(\beta > 0\)  
  b) \(\eta = -0.62\) | Effective buying income per household. | a) \(\gamma > 0\)  
  b) \(\gamma > 0\) |
  b) Basketball  
  c) National Football League (NFL)  
  d) Ice Hockey  
  Seasons (1968)  
  Seasons (1970)  
  Season (1972/73). Team.  
  Season attendance (baseball, football).  
  Game attendance (basketball and ice hockey). | a, b, c) Weighted average price x population.  
  d) Not included. | OLS | Average ticket price. | a) \(\beta < 0\)  
  b) \(\beta < 0\)  
  c) Not included (1968)  
  d) Not included. | a) \(\gamma < 0\)  
  b) \(\gamma > 0\)  
  c) \(\gamma < 0\) (1968)  
  d) \(\gamma < 0\) (1970) |
| Gärtner, Pommerehne (1978), Jahrbuch für Social Wissenschaft | Football West Germany | Seasons (1969-1975). 1 team. Match. | Attendance. | OLS | Average ticket price. | \(\beta < 0\) | Per capita income of the city. | \(\gamma > 0\) |
| Siegfried, Eisenberg (1980), Atlantic Economic Journal | Baseball USA and Canada | Seasons (1973-1977). Team. | Attendance (log). | OLS | Average ticket price. | \(\eta = -0.25\) | Per capita income. | \(\eta = 0.40\) |
  b) Division attendance. | 1) NLS  
  2) CORC  
  3) OLS | Minimum admission price + consumer expenditure on transport. | a1) \(\eta = -0.24\)  
  a2) \(\eta = -0.22\)  
  b) \(\eta < 0\) | Total consumer expenditure. | a1) \(\eta = -0.68\)  
  a2) \(\eta = -0.62\)  
  c2) \(\eta = -0.49\) (Div. 1)  
  c3) \(\gamma < \eta_1 < -1.15\) (Div. 2, 3 & 4) |
  Home team UR \(\gamma < 0\)  
  Away team UR \(\gamma < 0\) |
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| Kaempfer, Pacey (1986), *Social Science Quarterly* | College football (Minor Div. I-A) USA | Seasons (1975-1981). Team. | Attendance / season capacity. | OLS                | a) Real price of a reserved ticket. b) Price x attendance rate. | a) \(\beta > 0\)  
b) \(\beta < 0\) | Not included |                                |
| Medoff (1986), *Journal of Behavioural Economics* | Baseball USA | Season (1980). Team. | Attendance. | OLS | Average ticket price per seat. | \(\beta > 0\) | Per capita income. | \(\gamma < 0\) |
Panel data with presence of a lagged dependent variable | a) Real minimum price. b) Real average price. | a) \(\eta = -0.14\) (short run). \(\eta = -0.58\) (long run). b) \(\eta = -0.24\) (short run). \(\eta = -0.57\) (long run). | Real average weekly earnings in Victoria. | a) \(\eta = 0.37\) (short run). \(\eta = 1.46\) (long run). b) \(\eta = 0.31\) (short run) \(\eta = 0.74\) (long run). |
| Schollaert, Smith (1987), *Sociological Quarterly* | Basketball USA | Seasons (1969-1982). Team. | a) Total attendance. b) Percentage of seats sold. c) Number of unsold seats. d) Per capita attendance. | GLS (C) | 1) High ticket price. 2) Moderate ticket price. | a) \(\beta < 0\)  
b) \(\beta > 0\) | Median household income. | \(\gamma > 0\) |
2) GLS (C) | Minimum price. | a) \(\beta > 0\)  
a) \(\gamma > 0\)  
b1) \(\beta > 0\)  
b2) \(\beta < 0\) | Real per capita income in the team’s SMSA. | a1) \(\gamma > 0\)  
a2) \(\eta = 0.31\)  
b1) \(\eta = 0.33\) |
| Whitney (1988), *Economic Inquiry* | Baseball USA | Seasons (1970-1984 excluding year 1981). Team. | a) Team home attendance over a full season. b) Team home attendance over a full season (log). | SULS | Weighted average price of 15,000 most expensive seats x population. | a) \(\beta < 0\) (National League and American League) b) \(\eta = -0.18\) (NL) \(\eta = -0.55\) (AL) | Real per capita income in the team’s SMSA. | a) \(\gamma < 0\) (NL) \(\gamma > 0\) (AL) \(\eta = -0.21\) (NL) \(\eta = 0.24\) (AL) |
| Hansen, Gauthier (1989), *Journal of Sport Management* | Several sports USA and Canada | Questionnaires sent to the staff of 7 leagues. | Attendance per game. Attendance per season. | Factor analysis ANOVA | a) Price of ticket. b) Price of season ticket. | No results. | Average income of population. |                                |
| Fizel, Bennett (1989), *Social Science Quarterly* | College football (Minor Div. I) USA | Seasons (1980-86). Team. | Annual attendance/stadium capacity x n^a home games (AR). | OLS | a) Real average reserved ticket price per game. b) Price x dummy when AR is less than 85%. | a) \(0.06 < \eta < 0.56\)  
b) \(-0.22 < \eta < 0.04\) | Not included. |                                |
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<td>ηy = 0.04</td>
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<td>( \eta = -0.07 )</td>
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<td>Alchin, Tranby (1995)</td>
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<td>Unemployment rate.</td>
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<td>Seasons (VFL / AFL 1948-1994, SANFL 1948-1993). Match.</td>
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<td>Real minimum price of adult admission. a) VFL/AFL ( \eta = -0.11 ) (short run) ( \eta = -0.62 ) (long run) b) SANFL ( \eta = -0.23 ) (short run) ( \eta = -0.40 ) (long run)</td>
<td>( \eta &gt; 0 ) for all teams.</td>
<td>Average weekly earnings.</td>
<td>a) No results. b) Not significance.</td>
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<td>Baimbridge, Cameron, Dawson,</td>
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<td>Season (1993/94). Match.</td>
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<td>Weighted average (single and season) prices.</td>
<td>Quadratic function ( \eta = -0.38 + 0.05 \times \log (price) = -0.27 )</td>
<td>Average male weekly earnings.</td>
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<td>Baseball USA</td>
<td>Season (1993). Match.</td>
<td>Number of tickets sold (AL), gate attendance (NL) (log).</td>
<td>OLS</td>
<td>a) Average ticket price. b) Adjusted Fan Cost Index.</td>
<td>a) +1.13 &gt; (\eta) &gt; +0.89 (AL) -1.87 &gt; (\eta) &gt; -2.51 (NL) b) 0.04 &gt; (\eta) &gt; 0.22 (AL) -0.075 &gt; (\eta) &gt; -1.29 (NL)</td>
<td>Per capita income of MSA.</td>
<td>-0.38 &gt; (\eta) &gt; -2.65 (AL) -1.67 &gt; (\eta) &gt; -2.25 (NL)</td>
<td></td>
</tr>
<tr>
<td>Coffin (1996)</td>
<td>Baseball USA</td>
<td>Period (1962-1992). Team.</td>
<td>Team annual attendance.</td>
<td>OLS</td>
<td>Average ticket price.</td>
<td>(\eta) = -0.10 (period 62-75) (\eta) = -0.67 (76-92)</td>
<td>Median family income of MSA.</td>
<td>(\gamma) &gt; 0 (62-75) (\gamma) &lt; 0 (76-92)</td>
<td></td>
</tr>
<tr>
<td>Fort, Quirk (1996)</td>
<td>Baseball USA</td>
<td>Period (1976-1988). Team.</td>
<td>Annual attendance.</td>
<td>OLS</td>
<td>Weighted average ticket price.</td>
<td>(\eta) = 0.43 (AL) (\eta) = 0.50 (NL)</td>
<td>Per capita income of MSA.</td>
<td>(\gamma) &gt; 0 (AL) (\gamma) &gt; 0 (NL)</td>
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<tr>
<td>Kahane, Shmanske (1997), Applied Economics</td>
<td>Baseball USA</td>
<td>3 seasons (1990-1993). Team.</td>
<td>Yearly attendance.</td>
<td>OLS</td>
<td>Average real price.</td>
<td>-0.82 &gt; (\eta) &gt; -0.85.</td>
<td>Per capita income of MSA.</td>
<td>0.52 &gt; (\eta) &gt; 0.49</td>
<td></td>
</tr>
<tr>
<td>Marburger (1997), Managerial and Decision Economics</td>
<td>Baseball USA</td>
<td>Seasons (20). Team.</td>
<td>Team attendance (log).</td>
<td>GLS (H)</td>
<td>a) Real average weighted ticket price. b) Price of box seats relative to reserve seats. c) Price of reserve seats relative to general admission seats.</td>
<td>a) (\eta) = -0.56 b) (\eta) = 0.20 c) (\eta) = + 0.05</td>
<td>Not included.</td>
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<tr>
<td>Boyd, Boyd (1998), Journal of Economics and Finance</td>
<td>Baseball USA</td>
<td>Season (1984). Team.</td>
<td>Season attendance.</td>
<td>a) OLS b) 2SLS</td>
<td>Average ticket price.</td>
<td>a) (\eta) = -1.04 b) (\eta) = -1.20</td>
<td>Per capita income.</td>
<td>a) (\gamma) &lt; 0 b) (\gamma) &lt; 0</td>
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<tr>
<td>Author(s)</td>
<td>Sports Country</td>
<td>Data</td>
<td>Dependent Variable</td>
<td>Estimation Methods</td>
<td>Price</td>
<td>Coefficient($\beta$, $\eta$) Elasticity($\eta$)</td>
<td>Income</td>
<td>Coefficient($\gamma$, $\eta$) Elasticity($\eta$)</td>
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<td>Pan, Zhu, Gabert, Brown (1999), <em>Mid-Atlantic Journal of Business</em></td>
<td>Baseball USA</td>
<td>Seasons (5). Match.</td>
<td>Average attendance ratio per game.</td>
<td>2SLS</td>
<td>a) Average ticket price. b) Fan Cost Index – Prices.</td>
<td>a) $\beta &gt; 0$ b) $\beta &lt; 0$</td>
<td>Income mean household. $\gamma &lt; 0$</td>
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<tr>
<td>Welki, Zlatoper (1999), <em>Atlantic Economic Journal</em></td>
<td>NFL USA</td>
<td>2 seasons (1996-1997). Match.</td>
<td>Proportion of tickets sold.</td>
<td>a) TOBIT b) OLS</td>
<td>Real average ticket price.</td>
<td>a) $\eta = -0.17$ b) $\eta = -0.12$</td>
<td>Real per capita income of MSA. a) $\eta_i = 0.53$ b) $\eta_i = 0.53$</td>
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<tr>
<td>Gustafson, Hadley, Ruggiero (1999)</td>
<td>Baseball USA</td>
<td>3 seasons (1990-1992). Team.</td>
<td>Annual attendance.</td>
<td>OLS Canonical regression 3SLS</td>
<td>Average ticket price.</td>
<td>-0.06 &gt; $\eta &gt; -0.33$</td>
<td>Not included.</td>
<td></td>
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<tr>
<td>Fort, Rosenman (1999)</td>
<td>Baseball USA</td>
<td>2 seasons (1989-1990). Match.</td>
<td>Attendance/ Stadium capacity (log).</td>
<td>GLS (H)</td>
<td>Lowest non-specialty price. a)American League. b)National League.</td>
<td>a) -1.87 &gt; $\eta &gt; -2.99$ (AL). b) -0.39 &gt; $\eta &gt; -1.30$ (NL).</td>
<td>Mean per capita income SMSA. a) -1.38 &lt; $\eta_i$ &lt; -1.91 (AL) b) 9.66 &lt; $\eta_i$ &lt; -1.72 (NL)</td>
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<tr>
<td>McDonald, Rascher (2000), <em>Journal of Sport Management</em></td>
<td>Baseball USA</td>
<td>Season (1996). Game.</td>
<td>Attendance.</td>
<td>TOBIT</td>
<td>Fan Cost Index.</td>
<td>$\eta = -0.45$</td>
<td>Not included</td>
<td></td>
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<tr>
<td>Depken II (2000), <em>Journal of Sports Economics</em></td>
<td>Baseball USA</td>
<td>7 seasons (1990-1996). Team.</td>
<td>Annual attendance for team (log).</td>
<td>OLS MLE</td>
<td>Average price</td>
<td>$\eta = -0.45$</td>
<td>State median income. $\eta_i &gt; 0.95$</td>
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<tr>
<td>Putis, Sen (2000), <em>Applied Economics</em></td>
<td>NFL USA</td>
<td>Season (1996/97). Match.</td>
<td>a) Season ticket sales. b) Individual game ticket sales. c) Number of no-shows.</td>
<td>TOBIT PROBIT (IV) OLS</td>
<td>a) Mean season ticket price. b) Mean individual game ticket price. d) Fan Cost Index.</td>
<td>a) $\eta = -0.31$ b) $\eta = -0.28$ c) No significant. d) $\beta &gt; 0$</td>
<td>Mean median income in local market. a) $\eta_i &gt; 0$ b) $\eta_i &lt; 0$ c) Not significant.</td>
<td></td>
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<tr>
<td>Author(s)</td>
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<td>Data</td>
<td>Dependent Variable</td>
<td>Estimation Methods</td>
<td>Price</td>
<td>Coefficient(β) Elasticity(η) (Not significant in italics)</td>
<td>Income</td>
<td>Coefficient(γ) Elasticity(η) (Not significant in italics)</td>
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</table>
b) η > 0 |
b) β > 0 |
b) η = - 0.58 | City income. | a) η = 0.24 
b) η = 0.23 |
b) η = - 0.97 | Per capita income. | η > 0 |
| Poitras, Hadley (2002) | Baseball USA | 13 seasons (1989-2001). Team. | a) Attendance per game (log). a) 2SLS b) OLS | Ticket price. | a) η = - 0.21 
b) η = - 0.09 | Not included. |
<p>| Rivers, DeSchriver (2002), <em>Sport Marketing Quarterly</em> | Baseball USA | 4 seasons (1997-2000). Team. | Average game attendance for a single year. | OLS | Average price ticket for a game. | β &gt; 0 | Median household income. | γ &lt; 0 |
| Price, Sen (2003), <em>Managerial and Decision Economics</em> | College football (Div I-A) USA | Season (1997). Match. | Attendance. | TOBIT | % of the area per capita income. | η = - 0.11 | Not included. |</p>
<table>
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<tr>
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<th>Income</th>
<th>Coefficient(γ) Elasticity(η)</th>
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</thead>
<tbody>
<tr>
<td>Bhattacharya, Smyth (2003), <em>Australian Economic Papers</em></td>
<td>Cricket Australia</td>
<td>Period (1911/12-1983-84). Test Matches.</td>
<td>Average daily attendance at the match.</td>
<td>a) OLS b) GLS</td>
<td>Real adult admission price.</td>
<td>a) β &gt; 0 (linear) Not significant (log and log-log). b) Not significant.</td>
<td>Real male average weekly earning in the state.</td>
<td>a) Not significant. b) Not significant.</td>
</tr>
<tr>
<td>Lee (2006), <em>Journal of Sports Economics</em></td>
<td>Baseball Korea</td>
<td>Period (1982-2003). Match.</td>
<td>Total league annual attendance (log).</td>
<td>a) OLS b) FGLS (C)</td>
<td>Average real ticket prices.</td>
<td>a) η = - 0.06 b) η = - 0.47</td>
<td>Real per capita GDP. a) η = 0.43 b) η = 0.55</td>
<td></td>
</tr>
</tbody>
</table>
A detailed analysis of these papers makes it possible to highlight some common patterns regarding the main features of these demand studies. First of all, the normal practice has been to specify a one-equation model of demand using attendance as the dependent variable. However, some studies propose modelling an equation system, either as a simultaneous equation system to take into account the potential endogeneity of some of the explanatory variables such as price (Jones and Ferguson; Cocco and Jones; Paul; Leadley and Zygmont) or the winning percentage, or as a system where the equations are not apparently related to

<table>
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<th>Estimation Methods</th>
<th>Price</th>
<th>Coefficient(β) Elasticity(η) (Not significant in italics)</th>
<th>Income</th>
<th>Coefficient(η) Elasticity(η) (Not significant in italics)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coates, Humphreys (2007), <em>International Journal of Sport Finance</em></td>
<td>Baseball, Basketball, NFL <em>USA</em></td>
<td>Period (1991-2001). Team.</td>
<td>Average annual attendance (log).</td>
<td>GMM (IV)</td>
<td>a) Ticket price variable. b) Fan Cost Index.</td>
<td>a) η = - 0.26 (MLB) η = - 0.119 (NBA) b) η = - 0.160 (NBA)</td>
<td>Income per capita.</td>
<td>a) η = 0.153 (NBA)</td>
</tr>
<tr>
<td>Meehan, Nelson, Richardson (2007), <em>Journal of Sports Economics</em></td>
<td>Baseball <em>USA</em></td>
<td>Seasons (2000-2002). Match.</td>
<td>Total number of tickets sold.</td>
<td>TOBIT MLE</td>
<td>Fan Cost Index.</td>
<td>η = 0.594</td>
<td>Per capita income estimated.</td>
<td>a) η = 0.369</td>
</tr>
</tbody>
</table>

analyse different types of attendance (Demmert\textsuperscript{32}).

The functional form usually used is logarithmic; however, semi-logarithmic or linear specifications are also frequent because the researchers have not paid much attention to the suitableness of the functional form. One exception to this practice is the study of Jones et al.\textsuperscript{33} The most typical estimation method used in both cross-sectional studies and time series is Ordinary Least Squares (OLS), with few studies focusing on the problematic question of which is the best estimation method to use given the features of the specified model or the data used. In general, there has been little concern about the econometric aspects linked to these models. Now, these aspects are being taken into account more frequently for the majority of authors that use Generalised Least Squares or other appropriate econometric models.\textsuperscript{34}

One important issue is the potentially limited character of the dependent variable, given the capacity restriction. This possibility drives the use of econometric models different from the OLS regression model to correct that problem, the Tobit\textsuperscript{35} model.\textsuperscript{36} Other authors are worried about the features of the series used and the co-integration relationships between them (Simmons\textsuperscript{37}). Garcia and Rodriguez\textsuperscript{38} exploit the panel information to control unobservable effects associated with the teams that participate in the game (observation). Ahn and Lee\textsuperscript{39} set out a multiple time-period model based on rational expectations and lifecycle consumption. They use panel data and appropriate methods to estimate dynamic models with endogenous variables. They also control for team effects and temporal effects. Another interesting point is the theoretical scenario that joins habit and loyalty.

In column 5 of Table 1, special attention is given to the econometric techniques used in the studies analysed in this review. As was mentioned previously concerning the specification of these demand equations (attendance), the typical scenario is a standard demand function where economic variables (price and income) and specific variables of each observation (game and/or team and/or season) appear as

\textsuperscript{34} Worries regarding information quality and suitable methods of estimation are increasingly frequent. For example, see R.D. Fort, Y.H. Lee, Stationarity and Major League Baseball Attendance Analysis, in J. of Sp. Ec., vol. 7, n. 4, 2006, 408-415, for time series data.
\textsuperscript{35} Probably due to the characteristics of the problem to analyze, no paper has used the model of sample selection proposed by Heckman (1976 and 1979) which, unlike the Tobit model, permits that the factors which explain the fact of full capacity can be different, or having different effects, from the factors that explain the registered attendance.
\textsuperscript{37} R. Simmons, The Demand for English League Football: A Club-Level Analysis, cit., 22.
\textsuperscript{39} S.C. Ahn, Y.H. Lee, Life-cycle Demand for Major League Baseball, cit., 17.

3. Determinants of attendance (I): Economical aspects

The economic aspects we need to take into account as determinants of attendance are related to factors usually included in every model of demand (ticket price, prices of substitutive and complementary goods, and income), as well as variables referenced to the potential market size, like the population of the geographic area, the stadium capacity or the presence of strikes.

A great diversity of results regarding the effect of ticket price on attendance exists. It is expected that if there were an increase in ticket price, a smaller number of spectators would go to the stadium, so elasticity must have a negative sign and be significant. Nevertheless, although the price coefficient is negative in almost all the studies, it is also not significant in many cases, to the extent that most authors...
do not include it in their model. Cairns\textsuperscript{41} notes several reasons this can happen: the models are not well specified and the true relationship has not been properly identified because the ticket price does not represent the true price of attending a game. It does not include, for example, the price of transportation or other costs associated with game attendance. To Cairns, the lack of or unsuitableness of the data are also problems that arise with the estimations in relation to this variable.

On the other hand, we need to emphasize the empirical difficulty of measuring the relevant price for the attendance equation properly, given the different seats with different prices for the same sporting event. Depending on the situation, the authors use: (i) the average price of the tickets for sale (with or without weighting, depending on the type of ticket for sale), (ii) the average price of the tickets sold, or (iii) the minimum price of all the tickets for sale. The best measure should be the weighted average price of the tickets for sale, since it would include all the information about the variability of prices for each game. It would also not include the implicit endogeneity in usual measures like average price of tickets sold. In this way, the usual lack of information necessary to calculate the weighted price drives the use of minimum price, since it is an option less subject to the endogeneity problems mentioned previously for other measures.\textsuperscript{42} Column 6 of Table 1 summarises the variables proposed by different authors and column 7 shows values for the price elasticity of demand or of its coefficient value, depending on the specification.

The results presented in column 7 justify the theoretical concern introduced in the previous section about price elasticities which appear to be less than one in absolute value. If we take into account the corresponding confidence interval, we could consider estimations compatible with benefit-maximising behaviours in the traditional format, which is the case with the sports studied by Demmert,\textsuperscript{43} Noll,\textsuperscript{44}

\textsuperscript{41} J.A. Cairns, \textit{The Demand for Professional Team Sports}, cit., 18.
\textsuperscript{43} H.G. Demmert, \textit{The Economics of Professional Team Sports}, cit., 32.
Scully\textsuperscript{45} depending on the interpretation of depending on the interpretation of Salant,\textsuperscript{46} Stewart et al.,\textsuperscript{47} Boyd and Boyd,\textsuperscript{48} Ferguson et al.,\textsuperscript{49} Schmidt and Berri\textsuperscript{50} and García and Rodríguez,\textsuperscript{51} among others. In most cases, the price elasticities are negative, in spite of the fact that their absolute values are less than one.\textsuperscript{52}

An apparently atypical result is the one that appears to obtain positive price elasticities. Dobson and Goddard\textsuperscript{53} note that this result could be sometimes due to the fact that price is just a variable that approaches the team success; the best clubs are in a good position to fix higher prices at the same time that they are able to attract new fans. This justification is indirectly showing evidence about the potential endogeneity of the price variable.

As noted above, one of the reasons mentioned by Cairns\textsuperscript{54} when referring to problems concerning the price variable of the good, was that ticket price did not represent the true consumer cost, since the price of complementary goods was not included. In the case of sports, a group of complementary goods like parking, transport, consumption articles and drinks exists, which makes some authors point out that estimated price elasticities should be interpreted carefully, since its true value can be underestimated due to the missing costs of the complementary goods.

There are few authors who have used complementary\textsuperscript{55} goods in their


\textsuperscript{49} D.G. FERGUSON, J.C. JONES, K.G. STEWART, \textit{Competition within a Cartel League Conduct and Team Conduct in the Market for Baseball Players Services}, in \textit{The Rev. of Econ. and Stat.}, vol. 82, August, 2000, 422-430.


\textsuperscript{52} Elasticities higher than one in absolute value can be seen in Table 1. D.L. ALEXANDER, \textit{Major League Baseball: Monopoly Pricing and Maximizing Behavior}, in \textit{J. of Sp. Ec.}, vol. 2, n. 4, 2001, 341-355, reported an unusual elasticity of -5.19, bearing in mind that he uses an inverse demand function.


\textsuperscript{54} J.A. CAIRNS, \textit{The Demand for Professional Team Sports}, cit., 18.

estimations. In the studies of Bird\textsuperscript{56} and Bertonazzi et al.,\textsuperscript{57} another price is summed up into the ticket price: in the case of Bird, the price of the transport to go to the stadium; in the case of Bertonazzi et al., the fee paid to give them the opportunity to purchase the tickets and then the price of the actual tickets if they decide to attend the match.\textsuperscript{58} In relation to these goods, a separate approach to both variables appears more convenient. Some examples include Welki and Zlatoper\textsuperscript{59} using the parking price as an explanatory variable, Falter and Perignon\textsuperscript{60} with transport cost and Alchin and Tranby (1995)\textsuperscript{61} with the program cost. Another approach is to calculate the cost of the complement goods for each fan like Bruggink and Eaton\textsuperscript{62} do, or through the Fan Cost Index (FCI) like Rascher,\textsuperscript{63} among others. The influence of substitute goods varies among countries and sports. There are sports where other leisure activities, like theatre or cinema, can influence attendance. The presence of other professional sports or other teams in the same sport in the same city can also have an influence. In these cases, the prices of those services should be included in the estimation to estimate the attendance correctly. Nevertheless, in most of the literature, the substitute goods are treated by dummy variables which approach their effect. For example, there are many studies that capture, with fictitious variables, the existence of professional teams of the same sport in the same city, or the teams from other professional leagues. In most cases, the coefficient is negative. Sometimes are statistically significant and other times are insignificant.

Unlike the price, with an impact on attendance that is expected to be negative, \textit{a priori} expectations about the sign of the income variable coefficient are not possible. Some sporting events can be defined as normal goods and others as inferior goods. In the results of the empirical literature also reported on Table 1,\textsuperscript{64}

\textsuperscript{56} P.J. BIRD, \textit{The Demand for League Football}, in \textit{Appl. Ec.}, vol. 14, n. 6, 1982, 637-649.
\textsuperscript{58} Bertonazzi, Maloney and McCormick (1993, cit., 57) use the time cost of going to the stadium as an explanatory variable. This is similar to the part of the price represented by “time cost travel”, as used by Forrest, Simmons and Feehan, (2002, cit., 42).
\textsuperscript{62} T.H. BRUGGINK, J.W. EATON, \textit{Rebuilding Attendance in Major League Baseball: The Demand for Individual Games}, in J. Fizel, E. Gustafson, L. Hadley (eds.), \textit{Baseball Economic. Current Research}, 9-31, 1996. Bruggink and Eaton calculate cross elasticities, and the values obtained are $\eta_{xy} = +0.94$ for the American League and $\eta_{xy} = -1.29$ for the National League. In both cases, the elasticities are significant.
\textsuperscript{64} Column 8 of Table 1 summarises the variables proposed by different authors, and column 9
Noll suggests that basketball in the USA is a normal good. Australian football shows contradictory results: to Borland, it is a normal good, and yet in his study with Lye, it is an inferior good. The same mixed results occur with baseball and European football. To Noll, baseball is an inferior good, while to Kahane and Shmanske, it has positive income elasticity. To Fort and Rosenman, baseball is an inferior good in the American League (AL) but not in the National League (NL). To Coffin, income had a positive effect on baseball attendance in the 1962-1975 period, and negative but not significant effect in the 1976-1992 period. To Lee, baseball is a normal good in Japan, Korea and the USA. In European football, the coefficients obtained by Bird and Falter and Perignon are negative, while those obtained by Gärtner and Pommerehne are positive. To Simmons, football is a luxury good for Arsenal and Liverpool. To Feehan et al., attendance at live English football is a normal good. Ice hockey is an inferior good to Jones. Putsis and Sen found in the case of the NFL, the income augments the increase of the sale of tickets for the whole season but reduces tickets demand for individual matches. To Bertonazzi et al. and Welki and Zlatoper, the NFL is also an inferior good, as is cricket to Hynds and Smith and rugby in England to Baimbridge et al.
To Noll, the effect of the income variable can reflect the existence of some differences between different cities on a per capita income basis, for example, the regional, educational, industrial structure and the age pyramid of population. Hence, the interpretation of the income variable coefficient is highly controversial, with estimates that differ substantially among the various studies.

The most typical way to evaluate the income variable has been through per capita income. Nevertheless, some studies use alternative approaches instead of income. Bird uses real consumption spending, a variable which to Cairns is not satisfying due to variations in the saving tendencies and the taxes over the years. Weekly earnings are used by Schofield and weekly earnings only for men by Bhattacharya and Smyth. Wainwright and Pearson use real personal disposable income, while Schollaert and Smith use household income. Burdekin and Idson distinguish between white and black annual income. Hynds and Smith use real regional income as an approach to average gross income. Simmons uses regional real earnings. Falter and Perignon use home and away wage averages, while Baimbridge weights the GDP per capita income by dividing it by the distance. Several measures of median income are used by Rascher, Depken II and Putsis and Sen. City income was used by Depken II and Burdekin et al.

103-106.

84 R.G. NOLL, Attendance and Price Setting, cit., 44.
85 J. BIRD, The Demand for League Football, cit., 56.
86 J.A. CAIRNS, The Demand for Professional Team Sports, cit., 18.
92 M. HYNDS I. SMITH, The Demand for Test Match Cricket, cit., 82.
93 R. SIMMONS, The Demand for English League Football: A Club-Level Analysis, cit., 22.
96 D. RASCHER, A Test of the Optimal Positive Production Network Externality in Major League Baseball, cit., 63.
Independent of the influence that the definition of the income variable used may have on the results, the lack of variability (usually) of that variable for the same team throughout the season can show that this variable is correlated with other observable or unobservable variables that have the same variability structure. In particular, for one given season, this variable would capture the fixed effect of the home team that it was intended to specify.

Some authors have used unemployment explicitly as an approach (of contrary sign) to income. This is the case for Jennett, Dobson and Goddard and Leadley and Zygmont. Although, in other cases unemployment has been used together with the income variable, such as in the studies of Burdekin and Idson, Borland and Lye, Knowles et al., Dobson and Goddard, Alchin and Tranby, Fuller and Stewart, Rascher, Falter and Pérignon, Jones et al., Bhattacharya and Smyth and Owen and Weatherston. The most common result posits that

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110 D. Rascher, A Test of the Optimal Positive Production NetworkExternality in Major League Baseball, cit., 63.


113 M. Bhattacharya, R. Smyth, R., The Game is not the Same: The Demand for Test Match Cricket in Australia, cit., 88.

higher unemployment reduces attendance to stadiums where sport competitions take place, despite the fact that the significance of the coefficients is poor. However, as noted by Borland and Lye\textsuperscript{115} and Dobson and Goddard,\textsuperscript{116} it is possible that in periods of high unemployment, sports become more popular to help people manage personal frustrations. This could explain, in part, the positive sign found by Falter and Perignon.\textsuperscript{117} Burdekin and Idson\textsuperscript{118} analyse the influence of unemployment on attendance as a function of race, as well as of other categories such as blue-collar and white-collar.

The majority of the estimations referring to attendance equations consider the market size as an explanatory variable. The definition of “potential” market cannot be made in a precise way for many goods, so approaches to measure the market size are used. In our case, authors approach the potential demand using the total population of the metropolitan area (SMA) or the home team city.\textsuperscript{119} Nevertheless, not all the individuals of a town are potential demanders of a particular sport. In general, men typically demand more football services than women. Thus, Dobson and Goddard\textsuperscript{120} use male population as an explanatory variable instead of total population. In some cases, particular sports are more followed among some ethnic groups, which leads to considering only the population of a particular ethnic group.\textsuperscript{121}

When there is more than one club in the same city, some authors have divided the population by the number of the teams without any kind of weighting. This solution appears to be inappropriate. In fact, even if multiple teams belong to the

\textsuperscript{115} J. BORLAND, J. LYE, \textit{Attendance at Australian Rules Football: A Panel Study}, cit., 67.


\textsuperscript{120} S.M. DOBSON, J.A. GODDARD, \textit{The Demand for Standing and Seated Viewing Accomodation in the English Football League}, cit., 53.

same city, one of them will have a larger number of fans than the others. Therefore, it seems more convenient to use a population measure which permits weighting in favour of those teams that have a larger number of fans, based on the number of season ticket holders of each team, as Garcia and Rodriguez\textsuperscript{122} do.\textsuperscript{123}

In the case where a great number of fans from the away team go to support the team, some authors have included the population of the away team in their estimations: Hart et al.,\textsuperscript{124} Wainwright and Pearson,\textsuperscript{125} Walker\textsuperscript{126} and Janssens and Kesenne.\textsuperscript{127} The latter divide the away team population by the distance between both teams as an interaction term between the two variables. In general, as is expected, the demand for sports services shows a positive and significant relationship with the population variable.\textsuperscript{128}

The stadium capacity could also be thought of as a measure of the potential demand.\textsuperscript{129} Including this variable as a determinant of demand is questionable because capacity is a supply variable, as Demmert\textsuperscript{130} points out. Jones\textsuperscript{131} considers stadium capacity important if the team often reaches full capacity, but less significant if the stadium is usually at half of its capacity. However, in a subsequent paper, Jones and Ferguson\textsuperscript{132} omit stadium capacity, and in a subsequent study with Ferguson et al.,\textsuperscript{133} they treat the issue of capacity by splitting the sample into two

\textsuperscript{122} J. GARCIA, P. RODRIGUEZ, The Determinants of Football Match Attendance Revisited. Empirical Evidence from the Spanish Football League, cit., 38.
\textsuperscript{125} A.M. WAINWRIGHT, J.M.PEARSON, The Influence of Star Players on Football League Attendances, cit., 89.
\textsuperscript{130} Cairns (1990, cit., 18) states that the interpretation of these variables can be problematic and that there exists a problem with the election of estimation methods.
\textsuperscript{131} J.C. JONES, Winners, Losers and Hosers: Demand and Survival in the National Hockey League, cit., 78.
\textsuperscript{132} J.C. JONES, D.G. FERGUSON, Locational and Survival in the National Hockey League, cit., 27.
categories: the teams that always or almost always reach full capacity, and the ones that never or almost never reach it.

The effect of stadium capacity on demand may simply be highlighting the need to take into account the fact that this variable marks a limit higher than the observed attendance. Thus, Kahn and Sherer\textsuperscript{134} include it to control the upper limit of attendance. This limit of capacity implies, as we showed in the previous section, that the dependent variable in these demand studies has a truncated distribution, as Welki and Zlatoper\textsuperscript{135} or Kuypers\textsuperscript{136} illustrate. What seems evident is that, as Dobson and Goddard\textsuperscript{137} report, when this variable is included, it will be more significant when the stadiums of each club are usually full or at nearly full capacity.

Several authors have studied the influence of strike periods on attendance. For example, Schmidt and Berri\textsuperscript{138} and Coates and Harrison\textsuperscript{139} found that attendance declines during these periods, but after strikes attendance recovered. To Matheson,\textsuperscript{140} recovery to pre-strike levels has been accomplished though the construction of new stadiums and attendance has actually dropped since 1994-95 baseball strike in the U.S. The relevance of the new stadium, in particular, the first year, is positive to Rivers and DeSchriver,\textsuperscript{141} Schmidt and Berri\textsuperscript{142} and for Winfree et al.\textsuperscript{143} for at least a short time. Coates and Humphreys\textsuperscript{144} and Feddersen et al.\textsuperscript{145} find a positive “novelty effect” of new facilities.\textsuperscript{146}

\textsuperscript{134} L.M. KAHN, P.D. SHERER, Racial Differences in Professional Basketball Players’ Compensation, in J. of Lab. Ec., vol. 6, n. 1, 1988, 40-61.
\textsuperscript{137} S.M. DOBSON, J.A. GODDARD, The Demand for Standing and Seated Viewing Accomodation in the English Football League, cit., 53.
\textsuperscript{139} D. COATES, T. HARRISON, Baseball Strikes and Demand for Attendance, cit., 129.
\textsuperscript{144} D. COATES, B. HUMPHREYS, Novelty Effects of New Facilities on Attendance at Professional Sporting Events, in working paper n. 03-101, UMBC Economics Department, 2003, 1-19.
\textsuperscript{146} A more developed studies about the “honeymoon” effect of a new stadium and increasing attendance can be see in J.C. LEADLEY, Z.X. ZYGMONTE, When Is the Honeymoon Over? National Basketball Association Attendance 1971-2000, cit., 30, and C.M. CLAPP, J.K. HAKES, How Long
Quality of product is another aspect that needs to be taken into account in the development of equations for sporting events attendance. This variable in some way captures part of the heterogeneity of the product, since all the matches are different from one another because the teams competing are always different and their situation may change through the competition. Cairns\textsuperscript{147} contemplates the effect of this variable through the success probability (home team winning), which has a positive effect on attendance. The higher the expected quality of the home team, all things being equal, the higher the probability of success will be and the larger the demand will be. On the other hand, despite the fact that high away team quality, \textit{ceteris paribus}, will reduce the probability of success, there is evidence that the demand will also increase, as the expected quality of the away team rises, through the greater potential quality of the event as an alternative mechanism. For this reason, most studies have included expected quality measures for both teams when information referring to matches is used. The most-used quality indicator has been the position in the ranking of the clubs before the match.

In this review, we lay out the method of measuring quality through different components that was proposed by Kuypers.\textsuperscript{148} The factors include player quality, whether the match is expected to be exciting, the special interest in the match and the current form of the contestant teams. The different attributes which make up the quality of a team are expected to have a positive effect on attendance. Although the roster of a team frequently suffers from changes throughout the season, the quality of a team is a variable that can be considered constant over the season, measuring the quality at the beginning of the season independent of the latest current form. To approach this variable, different alternatives have been used: the budgets of the teams and the number of international players, or the existence of particular superstars on the team. For example, Falter and Périmon\textsuperscript{149} and Garcia and Rodríguez\textsuperscript{150} include the budgets of the home team as well as the away team, while the studies which approach the quality through the number of international players or superstars are much more frequent.\textsuperscript{151}

\textsuperscript{147} J.A. Cairns, \textit{The Demand for Professional Team Sports}, cit., 18.
\textsuperscript{150} J. García, P. Rodríguez, \textit{The Determinants of Football Match Attendance Revisited. Empirical Evidence from the Spanish Football League}, cit., 38.
\textsuperscript{151} Therefore, Kuypers (T. Kuypers, \textit{The Beautiful Game? An Econometric Study of Why People Watch English Football}, 1995, cit., 136) allows for the players who have been international in the last three seasons, and Ferguson, Stewart, Jones and Dressay (1991, cit., 36) and Rivers and DeSchriver (D.H. Rivers, T.D. DeSchriver, \textit{Star Players, Payroll Distribution, and Major League Baseball Attendance}, 2002, cit., 119) use the number of “superstars” on the team. Burdekin and
The exciting nature of a match is a not very precise concept that has been defined in the literature by different types of variables, all of which are expected to have a positive effect on attendance. For the case of football, for example, the performance is given by goals, thus, this is the most-used measure to gauge how interesting the performance was. Kuypers\textsuperscript{152} measures the interest of a match by scored goals in favour or against each of them teams in the last three matches. The larger the number of goals in favour or against, the higher attendance will be. On the other hand, Peel and Thomas\textsuperscript{153} incorporate the expected number of scored goals using data from betting, while Dobson and Goddard\textsuperscript{154} use the number of total goals of the home and away. For other sports, a measure of the exciting character of the match is the possibility of violence.\textsuperscript{155} In the case of ice hockey, Stewart et al.\textsuperscript{156} measure violence through some factors like the number of faults, serious and less serious, the number of sanctions in the match, and the number of matches punished by sanctions.

On the other hand, some matches are especially interesting for spectators, apart from the excitement that they can generate. This would be the case for matches between teams from the same city or “rival” cities, or for teams with a large tradition of rivalry independent of the geographical connotation or the beginning or ending matches of the season. This special interest must favour attendance. Usually, this type of information is incorporated to the models through dummy variables.

Finally, a team’s performance may condition the attendance (the more positive, the more attendance), referring to both the latest results and the results of each

\textsuperscript{152}T. Kuypers, The Beautiful Game? An Econometric Study of Why People Watch English Football, cit., 136.
\textsuperscript{155}This behaviour is similar to that of the attendees of other events who “ask for” more noise. See A.C. de Serpa, R.L. Faith, Bru-u-u-uce: The Simple Economics of Mob Goods, in Publ. Ch., vol. 89, October, 1996, 77-91.
\textsuperscript{156}K.G. Stewart, D.G. Ferguson, J.C. Jones, On Violence in Professional Team Sport as the Endogenous Result of Profit Maximization, cit., 47.
team over several seasons. The usage of these variables is, in a certain sense, a reflection of the “success” of the team. The most recent trajectory is normally approached by the number of points or winnings obtained in the latest matches (Forrest and Simmons\textsuperscript{157}).

Concerning the long-run format, depending on the sport considered, several approaches are possible: the number of final series that both teams were in during the last three seasons have been included (Borland and Lye\textsuperscript{158}), a dummy variable for the team classified for playoff in the previous year has been defined (Paul,\textsuperscript{159} the league position of the teams has been considered (Dobson and Goddard,\textsuperscript{160} Simmons,\textsuperscript{161} and Czarmintzki and Stadtmann, 2002\textsuperscript{162}) or the winning percentage has been included (Boyd and Boyd\textsuperscript{163}). The diversity of variables that can be built to measure the long term trajectory are numerous; the ones mentioned here are just a sample.\textsuperscript{164}

5. Determinants of attendance (III): Uncertainty of outcome

The appeal of a match or a championship is higher if the outcome is uncertain, than if one of the teams is presented \textit{a priori} as the clear favourite. This is detailed in Section II in relation to the Louis-Schmelling paradox pointed out by Neale.\textsuperscript{165} On the other hand, some spectators may go to the stadium only when they were convinced that the home team is going to win. Nevertheless, the most logical argument in sports economics notes that the matches with a higher uncertainty grade attract a larger number of spectators. In the literature, three forms of uncertainty of outcome have been distinguished, depending on the available information: match uncertainty, seasonal uncertainty and the absence of long-run

\textsuperscript{158} J. Borland, J. Lye, \textit{Attendance at Australian Rules Football: A Panel Study}, cit., 67.
\textsuperscript{160} S.M. Dobson, J.A. Goddard, \textit{The Demand for Standing and Seated Viewing Accomodation in the English Football League}, cit., 53.
\textsuperscript{161} R. Simmons, \textit{The Demand for English League Football: A Club-Level Analysis}, cit., 22.
\textsuperscript{164} One can consult M. Baimbridge, S. Cameron, P. Dawson (1996, cit., 119), who pay attention to position in the league in the previous seasons, R. Simmons, \textit{The Demand for English League Football: A Club-Level Analysis}, cit., 22, and S. Szymanski, R. Smith, \textit{The English Football Industry: Profit, Performance and Industrial Structure}, in \textit{Int. Rev. of Appl. Ec.}, vol. 11, n. 1, 1997, 135-153. Szymanski and Smith consider the results of several competitions (Cup + League Cup + European competitions). Also, Kahane and Shmanske (1997, cit., 69) use the winnings percentage of the team over the year.
domination of the championship by a particular club.\textsuperscript{166}

To measure match uncertainty, the authors have used different approaches. Hart et al.\textsuperscript{167} use the logarithm of the difference in league position of both clubs.\textsuperscript{168} According to Cairns,\textsuperscript{169} the majority of these studies ignore factors like the advantage of playing at home, if a team is or is not performing well, or if a team is gradually improving its league standings. According to Cairns, a possible interaction exists between uncertainty and current form, so that many times in these studies, it is difficult to individually identify the effects of the quality (via current form) and of the outcome uncertainty. Factors that measure match uncertainty have also been taken into account by other authors. Whitney\textsuperscript{170} calculates an average expected probability of winning using the percentages of wins from last season, last month and the season-to-date. Peel and Thomas,\textsuperscript{171} Knowles et al.,\textsuperscript{172}


\textsuperscript{168} Similar measures have been used by J.T. Siegfried, C.E. Hinshaw, The Effect of Lifting Television Blackouts on Professional Football No-Shows, cit., 20; P. Drever, J. McDonald, Attendances at South Australian Football Games, in Int. Rev. of Sp. Soc., vol. 16, n. 2, 1981, 103-113; J.C. Jones, Winners, Losers and Hosers: Demand and Survival in the National Hockey League, cit., 78; J.C. Jones, D.G. Ferguson, Locational and Survival in the National Hockey League, cit., 27; D.A. Peel, D.A. Thomas, Outcome Uncertainty and the Demand for Football: An Analysis of Match Attendants in the English Football League, in Sc. J. of Pol. Ec., vol. 35, August, 1988, 242-249; D.G. Ferguson, K.G. Stewart, J.C.H. Jones, A. Le Dressay, The Pricing of Sports Events: Do Teams Maximize Profit?, cit., 36; R.A. Smart, J.A. Goddard, The Determinants of Standing and Seated Football Attendance: Evidence from Three Scottish League Clubs, in Qu. Ec. Com., vol. 16, n. 4, 1991, 61-64; and many others. The difference in points between the home and away teams before the match, and its square, are used by Wilson and Sim (1995, cit., 119). A particular measure for uncertainty is used by Hynds and Smith (1994, cit., 82) due to the peculiarity of sport they study, cricket. In this case, a match lasts several days, but on the second or the third day it can be known which team will be the winner; when this happens, attendance decreases.

\textsuperscript{169} J.A. Cairns, The Demand for Professional Team Sports, cit., 18.


\textsuperscript{171} D.A. Peel, D.A. Thomas, Outcome Uncertainty and the Demand for Football: An Analysis of Match Attendants in the English Football League, cit., 168; D.A. Peel, D.A. Thomas, The Demand for Football: Some Evidence on Outcome Uncertainty, cit., 153; D.A. Peel, D.A. Thomas, Attendance Demand: An Investigation of Repeat Fixtures, in Appl. Ec. Lett., vol. 3, June, 1996, 391-394. Other possibilities are proposed with the same data used in the research of Peel and Thomas: J.A. Cairns, Uncertainty of Outcome and the Demand for Football, Discussion Paper n. 88-02, Department of Economics, University of Aberdeen, 1988. The uncertainty of the outcome, named p, d and q, is measured as related to the probability of the home team’s winning, a draw’s occurring or the away team’s winning. Four direct measures are used to measure the uncertainty of the match. These direct measures are (p – q)/d; (p – q); pq and p(1 – p).

\textsuperscript{172} G. Knowles, K. Sherony, M. Haupert, The Demand for Major League Baseball: A Test of
Kuypers,\textsuperscript{173} Dare and MacDonald,\textsuperscript{174} Rascher\textsuperscript{175} and Vergin and Sosik\textsuperscript{176} use the betting predictions before the match to establish the probability of winning for the home team.\textsuperscript{177} In fact, bets reflect all the information about both teams: current form, quality, advantage of playing at home, injuries, etc., so these bets are the first candidates to be used, “ex ante”, of the uncertainty of outcome in the match result, as pointed out by Forrest and Simmons\textsuperscript{178} and Dawson and Downward.\textsuperscript{179}

In relation to the uncertainty of outcome throughout the season, this can be measured through the position that the teams have in the battle to reach the championship or in their “play-offs” classification. This means that this type of uncertainty refers to the performance of each team in relation to the remaining teams in the championship. The measures proposed by authors to calculate the uncertainty of outcome throughout the season take different forms, and all share the idea that the considered team (home or away) is among the candidates for a certain target during the season. The differences in points or positions (Jones\textsuperscript{180}), or just purely quantitative information about these two variables, is normally the information used by the authors to measure seasonal uncertainty. For example, Canes\textsuperscript{181} uses a change of four or more places in a team’s position in league standing.\textsuperscript{182}

\textit{Uncertainty of Outcome Hypothesis}, cit., 106.
\textsuperscript{175} D. Rascher, \textit{A Test of the Optimal Positive Production Network Externality in Major League Baseball}, cit., 63.
\textsuperscript{178} D. Forrest, R. Simmons, \textit{Outcome Uncertainty and Attendance Demand in Sport: The Case of English Soccer}, cit., 157. Knowles, Sherony and Haupert (1992, cit., 106) conclude that attendance is maximised when the probability “ex ante” of the home team’s winning is around 0.6; for Rascher (1999, cit., 63), the figure is 0.66.
\textsuperscript{180} J.C. Jones, \textit{Winners, Losers and Hosers: Demand and Survival in the National Hockey League}, cit., 78.
An alternative approach involves arguing that a team does or doesn’t fight for the championship, as Jennett\textsuperscript{183} does when calculating the reciprocal number of matches that are needed to win the championship, before the match. The variables “home and away team championship significance” of the matches increase in value as the season progresses, until the team has a possibility of reaching the title. Jennett finds that spectators are attracted by the championship significance and, by extension, the total number of spectators of the league will be increased if the uncertainty about the next champion\textsuperscript{184} increases. Cairns\textsuperscript{185} uses a dummy variable to control for whether the team contention for the league championship influences the consumer’s perception of the attractiveness of a particular contest. This approach assumes that the individuals compare the results of their team against other teams, rather than against an absolute pattern (unobservable).\textsuperscript{186} To Kuypers,\textsuperscript{187} the uncertainty of outcome over the season is measured by three different measures that capture, in different ways, the number of matches left (GL) and the number of points behind (PB) the leader or above the limit position of relegation. In his study, the uncertainty related to the title and to the relegation to the second division is measured.

Finally, evidence exists in different sports for the probability of a long-run domination by a few teams in the league. This possibility can decrease attendance, not only for the clubs that do not win, but eventually for the team that wins because of the weariness effect. To consider the effect of a long-run domination, Borland,\textsuperscript{188} in a study about Australian football, includes the number of different teams in the finals in the past three seasons, divided by the number of finals berths available. He does not find evidence of lower attendance associated with a higher level of domination in the long-run. Comparing attendance for the same team match-ups over several seasons in the Football Association Association Challenge Cup (FA Cup) and in the league, Szymanski\textsuperscript{189} designs a “natural experiment” from English football. He finds that uncompetitive balance is increasing between divisions and that has led to a decline in attendance.

\textsuperscript{183} N. Jennett, \textit{Attendances, Uncertainty of Outcome and Policy in Scottish League Football}, cit., 101.
\textsuperscript{184} He also allows for the cases of relegated teams.
\textsuperscript{186} Borland and Lye (1992, cit., 67) use the sum of matches required to qualify for the finals. Carmichael, Millington and Simmons use the probability of winning the division: F. Carmichael, J. Millington, R. Simmons, \textit{Elasticity of Demand for Rugby League Attendance and the Impact of BSkyB}, in \textit{Appl. Ec. Let.}, vol. 6, December, 1999, 797-800. Garcia and Rodriguez (2002, cit., 38) consider the likelihood of winning the championship.
\textsuperscript{188} J. Borland, \textit{The Demand for Australian Rules Football}, cit., 66.
Very closely related to the uncertainty of outcome is competitive balance. In the demand analysis framework, Schmidt and Berri\textsuperscript{190} include Gini\textsuperscript{191} coefficients about competitive balance as explanatory factors in their attendance analysis covering several seasons. The authors take two different approaches: with time series, changes in the competitive balance have a significant influence on attendance; with panel data, fans respond negatively to improvement in the competitive balance in the results for one season. On the other hand, that competitive balance improvement, when considered at year three of a five-year period, increases attendance.\textsuperscript{192}

Instead of standard deviation, Humphreys\textsuperscript{193} uses three measures of competitive balance: the standard deviation of winning percentage,\textsuperscript{194} the Herfindahl-Hirschman Index and the Competitive Balance Ratio (CBR), defined as the ratio between the average time variation in win-loss percentage for teams in the league and the average variation in win-loss percentages across seasons. For the author, this last measure explains variation in attendance better than the other two alternative measures.

6. Determinants of attendance (IV): Opportunity cost and other factors

Attendance at live sporting events may involve some costs for the fans that condition their attendance to the stadium. According to prior research, factors that generate these costs are variables like weather, TV broadcastings, the day and time of the match, competition with other sports and the distance between the cities of the two teams.

At first, it seems we could assume that good weather would favour attendance to outdoor performances.\textsuperscript{195} However, attendance to stadiums competes with other

\textsuperscript{190}M.B. Schmidt, D.J. Berri, Competitive Balance and Attendance. The Case of Major League Baseball, cit., 50.
\textsuperscript{192}E.M. Eckard, Free Agency, Competitive Balance, and Diminishing Returns to Pennant Contention, in Ec. Inq., vol. 39, n. 3, 2001, 430-443, wants to test to see if attendance declines on average with each additional consecutive year of pennant contention. The independent variable is the number of years since the start of the streak (first or second place in league standings or 3\textsuperscript{rd} or 4\textsuperscript{th} with other conditions). The sign is negative and significant in all cases.
\textsuperscript{195}When using these variables, we have to be careful to not give them an explanatory capacity that really corresponds with the existence of regional differences in preferences or alternative leisure activities, more than indicating a direct climatological impact on the demand of tickets.
type of activities. Therefore, the results obtained with this variable are diverse. For example, Noll\textsuperscript{196} finds that American football attendance is lower when the proportion of sunny days is larger, and ice hockey attendance, which is played indoors, is higher when the average temperature in December is lower.

The ways of modelling the weather effect have been varied. Quantitative information about the temperature in degrees is used, as well as fictitious variables to capture the effects of whether it rains or not, or if it is a sunny or cold day. In this sense, Gärtner and Pommerehne\textsuperscript{197} find less attendance when rain is recorded, but they observe that temperature does not have a significant impact. Likewise, the evidence of a negative impact due to rain is reflected by Cairns,\textsuperscript{198} who reports weak evidence for a positive impact due to the sun. Siegfried and Hinsaw\textsuperscript{199} measure the current temperature in relation to the average temperature of October and November, and include a dummy variable for rainy or snowing days. In this study, these authors find the number of non-attendees when it rains or is colder significant.\textsuperscript{200}

In other studies, the incidence of weather is measured either through defining fictitious variables depending on the seasons (Falter and Perignon,\textsuperscript{201} Bhattacharya and Smith;\textsuperscript{202} and Owen and Weatherston,\textsuperscript{203} or the different competition months, or by incorporating an interaction variable with temperature and raining days (Welki and Zlatoper).\textsuperscript{204} In these cases, the specified variables capture not only the weather effect but also the course of the season, so it is difficult to interpret the results.

The TV broadcasting of matches may contribute to less attendance at the stadiums.\textsuperscript{205} Baimbridge\textsuperscript{206} find a negative and significant effect on attendance if

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\textsuperscript{196} R.G. NOLL, \textit{Attendance and Price Setting}, cit., 44.
\textsuperscript{197} M. GÄRNTNER, W.W. POMMERHNE, \textit{Der Fußballzuschauer-ein Homo Oeconomicus}, cit., 55.
\textsuperscript{199} J.T. SIEGFRIED, C.E. HINSHAW, \textit{The Effect of Lifting Television Blackouts on Professional Football No-Show}, cit., 20.
\textsuperscript{200} Similar results are obtained in J.M. ZUBER, J.M. GANDAR, \textit{Lifting the Television Blackout on No-Show at Football Games}, in \textit{Atl. Ec. J.}, vol. 16, n. 2, 1988, 63-73. Other studies, like those by Peel and Thomas (1992, cit., 153) or Welki and Zlatoper (1994, cit., 20) do not find a significant influence of climatology on attendance.
\textsuperscript{202} M. BHATTACHARYA, R. SMYTH, R., \textit{The Game is not the Same: The Demand for Test Match Cricket in Australia}, cit., 88.
\textsuperscript{205} The majority of the European studies take more into account the effect of national television rather than the regional variety.
\textsuperscript{206} M. BAIMBRIDGE, S. CAMERON, P. DAWSON, \textit{Satellite Broadcasting and Match Attendance: The Case of Rugby League}, cit., 83.
the match is broadcast live or via satellite. Garcia and Rodriguez make a distinction, for the case of Spanish football, between matches broadcast for free and pay-per-view matches; the loss of spectators is larger when the match is broadcast for free. Both variables are significant, unlike the results obtained by Peel and Thomas.

For Price and Sen, sports broadcasts had a positive effect on attendance due to greater advertising of the sport. A negative effect for all divisions of the English football league was found by Forrest and Simmons. Surdam finds contradictory effects in the case of the MLB. Some authors have analysed the effect that matches played close together can have on attendance to stadiums. Borland and Lye have taken this into account by including a fictitious variable; if the matches of a round are played during several days, they find that its sign is positive and significant. This means that attendance grows when the match concentration is low.

In studies based on information referring to particular matches, whether the match is played on a Sunday or a holiday is also important. Both Sundays and holidays seem to favour attendance to stadiums, according to Peel and Thomas, Hynds and Smith, Rascher, Garcia and

211 D.G. SURDAM, Television and Minor League Baseball: Changing Patterns of Leisure in Postwar America, cit., 123.
214 M. HYNDS I. SMITH, The Demand for Test Match Cricket, cit., 82.
215 D. RASCHER, A Test of the Optimal Positive Production Network Externality in Major League
Rodriguez,216 Paul,217 Forrest et al.,218 Paton and Cooke219 and Donihue et al.220

In addition to the day, the time of the match can also be a determinant of attendance. Welki and Zlatoper,221 Baimbridge et al.222 and Rascher223 analyse this question without finding significant effects for the time of the match on attendance. Even so, the inclusion of this variable is usual for cricket (see Paton and Cooke and Morley and Thomas224). Also, many fans travel to attend their team matches that are played at stadiums away from home. The quantitative importance of this displacement depends, to a large extent, on the distance covered and on the behaviour of a large number of supporters, who in some cases like English football go with their team when it plays away from home. To analyse this, some authors like Dobson and Goddard,225 Baimbridge et al.226 and Forrest et al.227 have included the first of these factors in their estimations, while the second one is captured by the “loyalty” effect, in this case, referenced to the visitor team.

Winfree et al.228 used two explanatory variables to capture the influence of

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228 J.A. WINFREE, J.J. MCCluskey, R.C. MITTELHAMMER, R.D. FORT, *Location and Attendance in
distance between teams on attendance: the inverse in miles to the nearest alternative stadium and a dummy variable if a new team moves within 500 miles of an existing stadium. These two variables reduce attendance and are significant. Loyalty to the team, understood as a habit of going to the stadium, attempts to capture the effect of spectator fidelity over the years. The variables used in the literature to capture this effect are attendance to previous matches and the age of the club.

Borland\textsuperscript{229} has pioneered the incorporation of an explanatory factor of attendance (defined in this case as the attendance obtained by both teams, in the same stadium, the previous season).\textsuperscript{230} Depending on the available information, the dynamic specification can deal with different definitions of the retarded variables (attendance at the last match played at home, average attendance for the previous season or just as Borland proposes). Dawson and Downward\textsuperscript{231} argue that one cannot pick up habit persistence by simply adding lagged attendance to demand equations; more explicit models are necessary for these authors.

The formation date of the teams has been used as a measure of loyalty, as have fictitious variables for teams of a particular age. It is usual to assume that teams that have been established longer will have a larger tradition, which can lead to a larger number of fans. A variable with these characteristics is used by Dobson and Goddard\textsuperscript{232} and Baimbridge et al.\textsuperscript{233} Coates and Humphreys\textsuperscript{234} use a trend variable as explanatory variable that shows attendance increasing within the first years in new facilities and then diminishing at different rates across the MLB, the NBA and the NFL.

Finally, we will mention some variables included among the determinants of attendance in different empirical studies that cannot be classified in any of the groups of variables discussed previously. The first variable is advertising, a variable that has passed unnoticed in most of the literature, perhaps because of the difficulty in obtaining data of this type. The authors who have put a bigger emphasis on a

\textsuperscript{229}J. Borland, The Demand for Australian Rules Football, cit., 66.


\textsuperscript{232}S.M. Dobson, J.A. Goddard, The Demand for Professional League Football in England and Wales, 1925-92, cit., 107.

\textsuperscript{233}M. Baimbridge, S. Cameron, P. Dawson, Satellite Broadcasting and Match Attendance: The Case of Rugby League, cit., 83; M. Baimbridge, S. Cameron, P. Dawson, Satellite Television and the Demand for Football: A Whole New Ball Game?, cit., 119; Leadley and Zygmont (2005, cit., 30) control for the effects of arena age and team age (dummies for the first 15 years of an expansion or relocated team).

\textsuperscript{234}D. Coates, B. Humphreys, Novelty Effects of New Facilities on Attendance at Professional Sporting Events, cit., 144.
variable such as this are Siegfried and Eisenberg,\textsuperscript{235} who consider newspaper or radio advertisements, and also the special promotions that teams make for baseball fans. Also, Alchin and Tranby\textsuperscript{236} and Kahane and Shmanske\textsuperscript{237} incorporate an estimate of the influence of advertising on attendance through a simple specification with a fictitious variable.\textsuperscript{238}

The racial composition of a team can also influence attendance.\textsuperscript{239} Specifically, Burdekin and Idson\textsuperscript{240} and Hoang and Rascher\textsuperscript{241} show that the more similar the racial composition of the team and the geographical area where it is based, the higher the average attendance to the stadium. The importance of the race of the first pitcher for a baseball team has been studied by several authors as a way to determine whether race has an impact on attendance. The conclusions of studies

\textsuperscript{236} T.M. ALCHIN, H.W. TRANBY, \textit{Does the Louis-Schmelling Paradox Exist in Rugby League Match Attendance in Australia?}, cit., 61.
\textsuperscript{237} L. KAHANE, S. SHAMAMSKE, S., \textit{Team Roster Turnover and Attendance in Major League Baseball}, cit., 69.

such as those by Hill et al.\textsuperscript{242} and Burdekin and Idson\textsuperscript{243} are consistent: if the first pitcher is black, the number of spectators decreases.\textsuperscript{244}

Finally, it is important to mention that in relation to the stadium, researchers have focused on more than just capacity, a topic that was discussed previously. Since the earliest studies of demand by Drever and McDonald\textsuperscript{245} and Becker and Suls,\textsuperscript{246} and the most recent ones by Dobson and Goddard,\textsuperscript{247} dummy variables have been generally used to control whether the features of the stadium and the location influence attendance.\textsuperscript{248}

\textbf{Conclusions}

In this paper, we have presented a review of demand literature in the field of sports economics, viewing demand as the payment for sporting events of professional teams. Special attention has been paid to the clubs’ behaviours as either profit-maximising companies, or as a utility function whose main argument is sport success in a theoretical scenario in which ticket prices are generally fixed in the inelastic range of the demand curve. Also, we have commented on the effect that the consideration of a wider definition of the cost to attend a sport event has on the price elasticity that is finally estimated. In this paper, an exhaustive review of the empirical literature about attendance was presented, with special attention dedicated to the way the dependent variable is defined in the different models, the types of

\textsuperscript{242} J.R. \textsc{Hill}, J. \textsc{Madura}, R.A. \textsc{Zuber}, \textit{The Short Run Demand for Major League Baseball}, cit., 238.
\textsuperscript{243} R.C. \textsc{Burdekin}, T.L. \textsc{Idson}, \textit{Customer Preferences, Attendance and the Racial Structure of Professional Basketball Teams}, cit., 91.
\textsuperscript{244} Burdekin, Hossfeld and Smith are not as severe with their interpretation of this variable: R.C. \textsc{Burdekin}, R.T. \textsc{Hossfeld}, J.K. \textsc{Smith}, \textit{Are NBA Fans Becoming Indifferent to Race? Evidence From the 1990s}, in \textit{J. of Sp. Ec.}, vol. 6, n. 2, May, 2005, 144-159.
\textsuperscript{245} P. \textsc{Drever}, J. \textsc{McDonald}, \textit{Attendances at South Australian Football Games}, in \textit{Int. Rev. of Sp. Soc.}, vol. 16, n. 2, 1981, 103-113.
\textsuperscript{247} S.M. \textsc{Dobson}, J.A. \textsc{Goddard}, \textit{The Demand for Standing and Seated Viewing Accomodation in the English Football League}, cit., 53.
\textsuperscript{248} With these variables, whether the stadium is new or old, if is a stadium considered to be classic, if it has been remodeled, and if it is indoor or outdoor can be controlled for. On this issue, see R.D. \textsc{Zuber}, J.M. \textsc{Gandar}, \textit{Lifting the Television Blackout on No-Shows at Football Games}, in \textit{Atl. Ec. J.}, vol. 16, n. 2, 1988, 63-73; B.R. \textsc{Domazlicky}, P.M. \textsc{Kerr}, \textit{Baseball Attendance and the Designated Hitter}, in \textit{The Am. Ec.}, vol. 34, Spring, 1990, 62-68; J. \textsc{Borland}, J. \textsc{Lye}, \textit{Attendance at Australian Rules Football: A Panel Study}, cit., 67; R. \textsc{Simmons}, \textit{The Demand for English League Football: A Club-Level Analysis}, cit., 22; D.A. \textsc{Coffin}, \textit{If You Build It, Will They Come. Attendance and New Stadium Construction}, cit., 71; \textsc{Kahane}, S. \textsc{Shamamske}, S., \textit{Team Roster Turnover and Attendance in Major League Baseball}, cit., 69; D. \textsc{Rascher}, \textit{A Test of the Optimal Positive Production Network Externality in Major League Baseball}, cit., 63; and R. \textsc{Butler}, \textit{Interleague Play and Baseball Attendance}, cit., 182. Also, Bruggink and Eaton (1996, cit., 62) control for this variable, but they measure it through stadium age.
data used and the different groups of determinants that influence attendance. In this context, the following issues should guide the most immediate developments in this literature: greater attention to the aspects related to econometric specification, such as considering the unobservable effects associated with the teams that play each match; the explicit “modelisation” of habits with the contrasting nature of the typical models; the consideration of potential endogeneity of some explanatory factors traditionally considered exogenous; and the incorporation and contrasting of studies concerning competitive balance or the usage of dynamic models.