



**Susana Teixeira
Soeiro**

**Determinantes das Assistências no Futebol ao Vivo:
A Liga Portuguesa**

**The Determinants of Attendance in Live Football:
The Portuguese League**



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Dissertação apresentada à Universidade de Aveiro para cumprimento dos requisitos necessários à obtenção do grau de Mestre em Economia, realizada sob a orientação científica da Doutora Marta Alexandra da Costa Ferreira Dias, Professora Auxiliar do Departamento de Economia, Gestão e Engenharia Industrial da Universidade de Aveiro

To my parents and brothers

o júri

presidente

Prof. Doutor António Miguel Amoedo Lebre de Freitas
professor auxiliar da Universidade de Aveiro

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professor auxiliar da Universidade do Coimbra

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agradecimentos

"Football is a part of I. When I play the world wakes up around me."

Bob Marley

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You know you love me,

XOXO
Susana Soeiro

palavras-chave

economia do desporto, futebol, dados em painel, assistências

resumo

O declínio das assistências em jogos da Liga Portuguesa de Futebol, tornou-se recentemente o foco de muita preocupação. Uma análise econométrica da procura para o futebol é apresentada, usando dados das assistências médias por jogo e jornada para as épocas 2006 até 2012 e 2006 até 2011, respectivamente. Verifica-se que o rendimento tem um efeito positivo. Entre outras variáveis de importância que explicam a procura estão o *derby*, os *derbies* regionais e a incerteza do resultado. O cálculo da elasticidade rendimento da procura mostrando que o futebol português é um bem de luxo.

keywords

sports economics, football, panel data, attendance

abstract

Declining attendance at Portuguese Football League match recently have become the focus of much concern. An econometric analysis of the demand for football is presented, using average attendance per match and per fixture data for the seasons 2006 to 2012 and 2006 to 2011, respectively. It is found that increases in real income a positive impact. Amongst other variables of importance in explaining demand are the derby, the regional derby and uncertainty of outcome. Elasticity of demand are calculates and it is shown that Portuguese Football is a luxury good.

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Acronyms

Académica - Associação Académica de Coimbra

Beira-Mar – SC Beira-Mar

Braga – Sporting Clube de Braga

FCP – Futebol Clube do Porto

Feirense – Clube Desportivo Feirense

FPF – Federação Portuguesa de Futebol

Gil Vicente – Gil Vicente Futebol Clube

Guimarães – Victoria SC

IDP – Instituto do Desporto de Portugal

IMF – International Monetary Fund

INE – Instituto Nacional de Estatística

Leiria – UD Leiria

LPF – Liga Portuguesa de Futebol

Marítimo – CS Marítimo

Nacional – CD Nacional

Naval – Associação Naval 1º Maio

Olhanense – SC Olhanense

P. Ferreira – FC Paços de Ferreira

Portimonense – Portimonense SC

Rio Ave – Rio Ave FC

Santa Clara – Santa Clara CD

SCP – Sporting Clube de Portugal

Setúbal – Vitória Futebol Clube

SLB – Sport Lisboa e Benfica

I. Introduction

With the introduction of the Sport Anonymous Society (SAS), albeit slight, the clubs taking part in competitions organized by the Portuguese Professional Football League need to supply a level of transparency and to provide information to stakeholders.

This professionalization of the management of football clubs has enabled to place, from the SAS, the objective of profit maximization, conditioning the purpose of sportive success on football. Thus, clubs are required to submit the ambition of sportive success to the scrutiny of the financial market since as they are not free from the risk of insolvency or bankruptcy as any firm.

The Portuguese Football League has obvious structural problems. Many of these are also shared by some of the major European football leagues. The Portuguese teams still exhibit some outstanding solutions, with respect to the ability to generate revenue.

The Portuguese league, like many others, has as its primary source of revenue the transfer of players. These revenues are directly dependent on three factors: training, prospecting and negotiating skills. The fans are also a very strong base for all teams along with the sales of tickets and annual places in stadiums. This fact is crucial to the financial stability of teams.

There are four pillars in the Portuguese economy of football where we can see examples of success in terms of raising revenue. Some of these examples are references on national level, and others are models of international significance, used as case studies by many other European teams.

The first pillar is the Training and Prospecting, One of the most prestigious and mentioned academies in the world, with regard to the training of young players is the Academy of *Sporting CP*. For the past few decades the formation of *SCP* has produced some of the best players in the world, such as Futre, Figo, Simão, Quaresma, Cristiano Ronaldo, Nani, among others. Thus, in recent decades the club has benefited financially from the sale of its best players. Through the implementation of FIFA's system of compensation for training clubs, *SCP* has continued to generate revenues through time with the transfers of players trained at the Academy of Alvalade to other clubs.

The second pillar is the Negotiation and Transfer. So the negotiation is a crucial point for the clubs. Today every big club in Europe that wants to reinforce their squad may

have the Portuguese league as one of the showcases of players. Several key players from Portuguese football club have been purchased by major European league. *FC Porto* has stood out considerably in this aspect, generated more than 380 million Euros in the last 10 years. *SC Braga* a club with less resources is also worthy of note, by the fact that in the last five years generated about 25 million euros by selling players.

The third pillar is the Members and Enthusiasts. Portugal is the European country with the greatest tradition in regarding to associations. The country has managed to put the three largest teams in the Portuguese League among the ten clubs in the world with larger number of supporters. One of the marketing campaigns conducted by *SL Benfica*, "New Member Kit" led the club to the top of the world ranking of clubs with more supporters overcoming the giant *FC Barcelona*. *SLB* has currently about 190.000 paying members, and from it can generate about 10 million euros. Even looking at the 'smaller' clubs, we can highlight the *Vitoria Guimarães*, who through various actions among its supporters has over 35.000 members.

Finally, we have the fourth pillar, the Box Office and Annual Seats. This pillar is related to sports scores. Moreover, the sale of tickets is also related to the number of supporters of the club and the marketing actions use to attract more followers. The capacity of Portuguese League stadiums is not a major issue in Portugal due to the very low percentage of occupation of the stadiums. We can highlight *SLB* attendance with averages between 45.000 and 50.000 spectators. In turn, the sale of annual seats is dependent on the sports results from the previous season (DOBSON et al., 1992). *SCP* is the club holder of record at the sale of annual seats, selling last season about 35.000 annually seats, generating more than 7.5 million of Euros. To highlight the *Guimarães*, by the more than 20.000 seats sold per year, although with lower numbers than the regular annual seats sold by *SLB* and *FCP*, stands out due to the reduced amount of supporters and members. In the present study we will focus on the third and fourth pillar. The central aim of our study is to discuss the factors that determined attendance at the Portuguese Football League match and fixtures in seasons from 2006 to 2012 and from 2006 to 2011, respectively. Using panel estimation, we intend to capture and recognize the observable characteristics of each match (and fixtures) during the season considered. Concluding that economic variables, uncertainty, quality and incentives factors affect football matches attendance.

This paper is organized in 6 sections. Following this introduction, section 2 presents the reasons for the empty stadiums in Portugal. Section 3 presents the evolution of Portuguese attendance, section 4 present the empirical study, section 5 present empirical results and section 6 offers a conclusion.

II. The reasons for the empty stadiums in Portugal

Clubs and organizational institutions of Portuguese football have not yet found rational strategies to attract the public. It is necessary to do promotions for accompanying of members, groups tickets, places for families, protocols with educational institutions, and ways of attracting the female audience, among others ways of attracting public to stadiums.

Trusting football management as if it were just a business, subject to the neoliberal principles of total commercialization and business rationalization, led to the abandonment of the stadiums by thousands of loyal fans, tired of being treated as mere consumers. Thus, we see several reasons in the literature¹ for the lack of fans in stadiums. These reasons have been grouped into four arguments, described below.

i. The ‘economic’ argument: the high price of football tickets

The price of tickets is the most popular reason to explain the lack of attendance in the Portuguese stadiums, but also in other European League and sports (BORLAND et al., 2003, VILLAR et al., 2009). The tickets for the matches are considered too expensive for most Portuguese families, considering the economic and financial situation in the country. However how much costs to watch a football match live in Portugal? According to the *Journal Publico*²:

An economically adept from *Benfica* spent, in February 2011, 164 euros to follow the team on six games, assuming that is a member, who always chose the less expensive tickets, the most economical means of transport and dispensed from going to Germany, to watch the match against Stuttgart (only travel and hotel cost 950 euros).

So we can say that in Portugal, to watch the football is not for everyone, it is only for those who can. One way to overcome this is the opening of the stadiums for free, as did *Leiria*, *Belenenses* or even *Beira-Mar*, in order to attract attendance to the stadium. The result is almost always a full stadium. LEMKE et al. (2010) concluded for Major League Baseball that attendance increases with the holidays, with the summer vacation, promoted

¹ Empirical studies on the demand for team sports cover a range of sports including basketball, cricket, baseball, hockey, Australian Rules football and soccer, including an equally diverse range of explanatory variables.

² See PUBLICO (2011)

days, when the game is considered a derby and when the home team, playing for a spot in the playoff.

Carlos Carvalhal coach of *Belenenses* in 2004/05 season, said at a press conference: ‘Football has less people because the price of ticket are too high³.’ Several authors have reports that with higher prices of ticket, less attendance in the stadiums (AHN et al., 2007, KAHANE et al., 1997). Such declarations led to an explicit and visible support at various Portuguese stadiums.

But can it be said that the prices of ticket in Portuguese first division are actually more expensive than in some of the major European football leagues? In 2005/06 season the *German Football Federation* released the average prices of some of the most important European leagues (Table 1) where we can observe even if that the Portuguese league does not have the highest ticket prices of the four leagues analyzed, the average attendance is the lowest.

Table 1 - Average gates and prices ticket for the major European Leagues in season 2005/06⁴

League	Average number of spectators	Average price of tickets (in euros)
Bundesliga (Germany)	37 314	18,71
Premier League (England)	33 900	44
BBVA (Spain)	27 800	25
Liga Betandwin (Portugal)⁵	9 778	20

Source: Developed with data from *Jornal Record*

Currently, the high ticket prices are already affecting other leagues. The only league that keeps reasonable prices is the *Bundesliga*. To see a match at the *Bernabeu* stadium (*Real Madrid*) costs on average between 45 and 150 euros, the highest prices in Europe. For less than 25 euros is impossible to see a football match in Spain.

In Portugal, there are negative effects on the price of tickets. The lack of criteria for the formation of prices by the teams has taking into account the degree of importance of the game, the consideration of the costs of going to the stadium and the economic conditions of the Portuguese people. Contrary to what happening during some seasons of the 80s, where was applied a maximum value of 4.74 euros for the tickets of the most

³ See DN (2005)

⁴ See RECORD (2006)

⁵ Value without statistical rigor

expensive game. This ‘cap’ has not existed for several seasons, has only recently been implemented a ‘cap’ for the more expensive tickets⁶.

In the literature these effects are considered. BIRD (1982) using attendance for the English Football claims that prices must take into consideration the price of travel to the stadium and the uncertainty of the outcome. FALTER et al. (2000) concluded that French football is an inferior good, which unemployment affects attendance positively and negatively, on the other hand wages negatively affect the attendances. Confirm the finding of a negative effect of transport costs. HART et al. (1975) created a model for the Premier League concluded that the distance is an impeding factor for fans that are away from the club they support. Another factor affecting demand is the importance of the opposing team.

Therefore, we conclude that the prices charged in stadiums by football teams, may be relatively high compared with the economic capabilities for the people who attend to the ‘beautiful game’.

ii. The ‘Football on Television’ Argument: The Other Game

The decrease in the attendance of live matches in the mid-90 is directly linked to the spread of television broadcasts of the Portuguese premier league of football. In the literature we found several studies that observe a negative influence of television in attendance (BORLAND et al., 2003, VILLAR et al., 2009) In the 80’s watching a game on television was almost impossible, however this fact has changed with the first transmission of a national championship game per week, going to several games a week transmitted by *Sportv*⁷. Since it started 1998, *Sportv* ensured the transmission of three to four games per fixture of the Portuguese first division, in addition to several other national and international competitions.

The Portuguese, who subscribe this cable service, will have at their disposal four of the nine games in the Portuguese championship, with one more than is transmitted in open signal and also a variable number of international matches, including the Champions League, UEFA Europe League, Spanish, English and Italian leagues, the National team, among many others.

⁶ Currently the ‘cap’ is 65 euros.

⁷ Portuguese cable Channel

The exhaustive coverage by the television, caused a decrease of the attendance in various countries, i.e. a growing in the football television audience implies a decrease of attendances in the stadiums. Studies in English football and rugby (BAIMBRIDGE et al., 1995, 1996, CARMICHAEL et al., 1999) confirms a negative influence on the broadcast of the matches in attendance. In a study for the Spanish football (GARCÍA et al., 2002), was also found empirical evidence of the transmission of the matches on television decreases attendance in stadiums.

But this evidence is not present in all studies. Several authors stated that the broadcasts of the matches positively influence attendance (BORLAND, 1987, PRICE et al., 2003, VALÉRIO et al., 1996).

The globalization of football chooses the mediation of the game, instead of the live show, jeopardizing the traditions, calendars and hours of the matches. A football match is sold as a TV show, and concern is the conquest of the share instead of audience in the stadium.

This dependence of the football clubs can have drastic consequences in the medium term to the industry, since the values, once exorbitant, paid by TV channels to the clubs are decreasing.

iii. The ‘Quality of the Football’ Argument: the Lack of ‘Beautiful Game’

The lack of quality of the games in Portugal, the team’s inability to entertain the attendances, slightly spectacular football, always with too many stops and faults, may be the major responsible for the absence of the public in the stadiums.

But what is the definition of a good game of football? Is it an aesthetically “beautiful game”? Is it an exciting match? Is it one with lots of goals? Is it an interesting battle of tactics? Or is it quite simply our team winning? Well, the resisters who have not yet been won over by TV don’t go to the stadium to be entertained, but for the spiritual, irrational, mindless experience that football provides. And of course, all they want is for their team to win. Obviously, if the team wins by playing well, the fans come out more satisfied, but the important thing is a game that the team wins, especially if that game is against a rival or an international competition.

The uncertainty of the outcome and team success, are related concepts and are often studied together. The performance of the team may condition the attendance, i.e. the more positive team performance further attendance in stadiums. This is considered by several authors. FORREST et al. (2002) and KAHANE et al. (1997), concluded for Major League Baseball and English football, that the team performance has a positive effects on attendance. SIMMONS (1996) concluded for English Football League, that league position, goals scored and promotion and relegation have effects on attendance.

JENNETT (1984) analyze the attendance to Scottish Football League, concludes that increasing the short-run uncertainty of outcome is not sufficient for the leagues increased their attendance, and thus necessary to increase the long-run uncertainty of outcome to ensure the prosperity of the football leagues.

SIEGFRIED et al. (1980) analyzed the demand in minor league Baseball and concluded that quality and excitement of the game, are an important factor for the fans of baseball, i.e. has a positive impact on demand.

Demand for Australian Rules Football was approached by BORLAND et al. (1992), noted that the behavior in consumption, the size of the stadiums, the uncertainty of outcome and success of the team are important determinants of demand for football. NOLL (1974) examined the four major sports in America, noted that the uncertainty of the outcome is a determinant of demand, by influencing the attendance positively.

DOBSON et al. (1992) studied the sensitivity of the performance of the teams in the demand for seats and standing in the matches of Premier League, concluded that the demand seating is less sensitive to current performance than demand for standing, and the reverse holds for previous performance. This may reflect that seating admission is composed mainly of the season ticket holders. FALTER et al. (2000) claimed that the house effects, the position in the table and the inequality of the final objective has great explanatory power for the team's success.

By observing the attendance averages of the 'big three' we can mention there is a tendency for clubs with worse outcomes suffer a break in attendance in their stadiums, regardless of the quality of play. DOMAZLICKY et al. (1990) concluded that the winning percentage increases the attendance. In this fact, joins the very high average of fouls committees per match, with overwhelming implications on the quality of games and on the actual average of useful time in the game. JEWELL (2012) concluded for English Football

League that the aggressiveness of the match has a significant effects in attendance, varying with the quality of the team and the type of infraction.

iv. The ‘Concentration of Power’ Argument: the Big Three's Social and Sportive Hegemony

Another argument explaining the empty stadiums focuses on the idea that there is a kind of autocracy of the big teams in Portugal, thus preventing the growth of other teams and the football itself. This fact is related with a structural problem of our football: the lack of sports culture in Portugal. Seems to, this problem remove attendance far away from stadiums.

The fact that people like more of the team that football is a cultural problem which may also explain the absence of attendance in the stadiums. Only if the team is getting good results a supporter will see the matches, otherwise he is not interested. To watch football only by the simple fact that we like the game does not happen. However in other countries is not the case. For example in Spain, when *Real Madrid*, *Barcelona* or *Atletico Madrid* are away from first place, these teams continue with sellouts.

In Portugal, if the *FCP*, *SLB* and *SCP* are not at their best, there is a decrease of the attendance in their games. Instead, in England or Germany teams that are near the relegation continue to have full stadium. By observing the 2010/11 season, we see on that teams like Naval who obtained attendance under one thousand spectators per game.

This fact is analyzed in the literature, by the quality of the team variables. Several authors use the variable derby to distinguish this type of matches, since it is a variable that classifies the rivalry that exists between the team. The derbies are matches of extreme importance in the league, so we can say that they increase attendance (BAIMBRIDGE, 1997, WILSON et al., 1995).

Well, this loyalty towards one of the ‘big three’ leads to social and sportive hegemony of these teams, making the life a lot harder to the smaller teams. By reviewing the number of average attendance in the Portuguese first division in 2010/11 we can see that more than 62% of the total, are spectators concentrated on three stadiums, *Estadio do Dragão*, *Estadio da Luz* and *Estadio Alvalade XXI*. Clearly, the improvement shown on recent seasons in terms of average attendance is due to the ‘big three’ teams.

However we find that in the literature, there are cases in which there are derby by geographical boundary, i.e. teams that are in the same location. Such match increases attendance (BAIMBRIDGE, 1997, BAIMBRIDGE et al., 1996). In Portugal, some of these derbies are between the smaller teams⁸.

The weight and importance of games broadcast on TV in the increasing inequality between the clubs may be one explanation for the concentration of fans in the 'big three' (NEVES, 2004). Since, the young football fans increasingly support the most popular clubs, with the best results, and hosting the best players or clubs that normally see on television.

The final positions of the clubs are another reason for the concentration of power in the 'big three'. Looking at the Portuguese Championship, with already 78 editions, we found that only twice⁹ the championship was even by one team outside the 'big three'. Furthermore, more worrying is the fact that the champions, including the two outsiders, are from always Porto or Lisbon, showing a huge geographic concentration of football power.

We can conclude that the 'big three' influence attendance in Portuguese Football League, causing fans to focus on these three teams. CAIRNS (1987) stated, for Scottish Football League, that big matches increase attendance. And these matches could become more frequents in order to increase attendance.

⁸ See variable Derby1

⁹ CF Belenenses, season 1945/46 and Boavista FC, season 2000/01

III. *Evolution of Portuguese Attendances*

Although the Portuguese football is reasonably well-known world-wide, at least since the winning days of *SLB*, since the performance of the football national team in 1966, the general idea abroad that Portugal is a ‘country of football’ is much more recent. However, those who reside in Portugal, even if they don’t share the interest in this sport, have long been aware of the social importance of football in the country. Television ratings, sports newspapers sales or the omnipresence of the topic in everyday conversations leave no doubt about the social and economic impact of football in Portuguese society.

Football seems to be everywhere in Portuguese society. This fact justifies the relevance of the research on a seemingly paradoxical reality that characterizes the Portuguese football: the small number of spectators traveling to stadiums, given the importance of the sport. Why is it that Portuguese fans stay away from the stadiums, supposedly the ideal place for football, if they like football so much?

Even if data on the average number in viewers of the 1970s and 1980s, is not available. We can see through the images of the games and reports in sports newspapers at the time¹⁰, the floods in football stadiums, especially in the area behind the goals, where the prices were cheaper. Looking at the table below (Table 2) shows the abysmal differences in average attendance per game.

We can say that the ‘big three’ are primarily responsible for the massive attraction of spectators to the stadiums, i.e. are the major market drivers in Portuguese Professional Football.

In the 70s and 80s, was usual home attendance over fifty thousand in ‘big three’ matches and even on matches out they attract thousands of fans. *Benfica* managed in one game, against *Porto* or *Sporting*, attendances hovering one hundred thousand spectators. Another important fact which highlights these decades, is the lack of attendances in a matches below the five thousand spectators, which in the 90s and even in recent years became regular, with most clubs to present averages attendances per match below that number.

¹⁰ Newspaper ‘A Bola’ and ‘Record’; PASSADO (2007) and among other Blogs

Table 2 - Comparison of Average Attendance per Match (and weight of big three) in the First Division in 1985/86, 2000/01 and 2005/06

Season	Average Attendance	Weight of 'big three' ¹¹
1985/86	20 000	-
2000/01	5 273	Just over 50%
2005/06	9 778	66,48%

Source: Developed with data from *Jornal A Bola*¹² e *As Finanças do Futebol Profissional*¹³.

Looking in the official data from the season 2000/01, we find that this season was the lower point on attendance, probably ever for the Portuguese First Division, with an average of five thousand spectators. In the same season the 'big three' do not reach averages of twenty thousand spectators. By observing the means of the clubs, we found that the *SC Compomaiorense* has an average of 620 spectators, thus having an occupancy rate of 5% and 12 of 18 teams are below the average of the Portuguese Premier League.

As can be seen in the graph above (Graph 1), in the 90s the average attendances to games of Portuguese 1st Division did not come close to the average in previous decades. During this decade it has never exceeded ten thousand spectators per game. It can be concluded that clubs called 'smaller', no longer have averages of ten thousand spectators, and only achieve similar values of spectators in some games against the 'big three'. Attendances of fifty thousand have become sporadic and they have place in stadiums of *FCP*, *SCP* or *SLB*.

This evolution of decline in terms of frequency of spectators in Portuguese stadiums was never identified before in the history of the sport in Portugal. The explanations for this behavior are diverse. One plausible explanation may be the conjuncture factors, i.e. the poor seasons for one or two of the 'big three', namely the *SLB* and *SCP* with unusual outcomes of these clubs¹⁴, as a whole continue to hold more than half of the attendances.

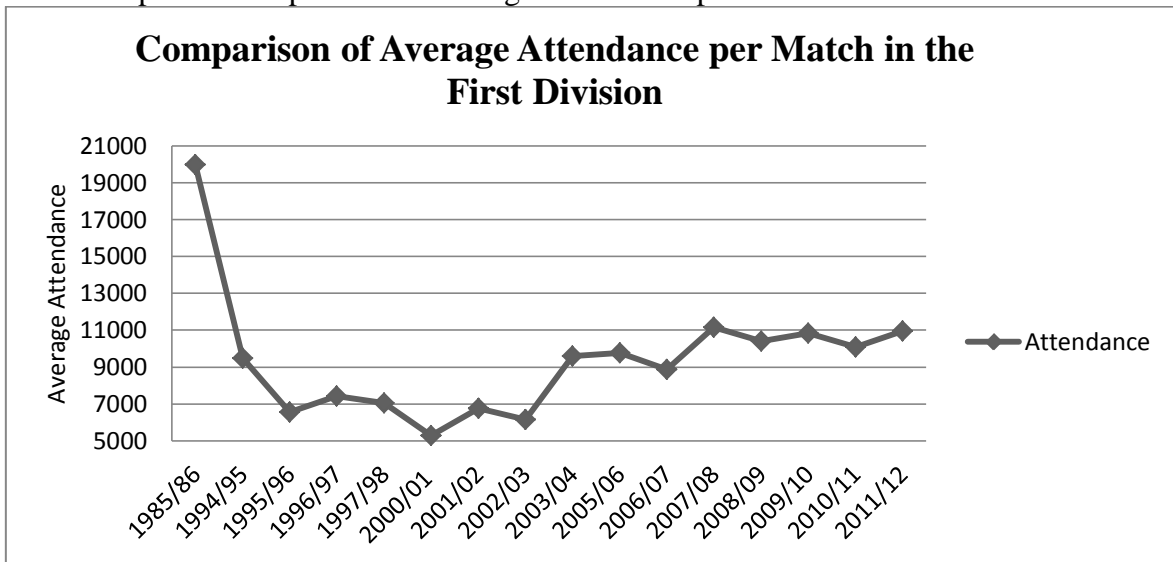
¹¹ Weight of the 'big three' divided by weight of all the teams in the league

¹² See BOLA (1945)

¹³ A study conducted by Deloitte & Touche for the journal "A Bola" in partnership Portuguese Professional Football League.

¹⁴ SL Benfica: 6th place in season of 2000/01 and 4th place in the seasons of 2001/02 and 2007/08; Sporting CP: 4th place in the seasons 1991/92, 1997/98, 1998/99 and 2009/10.

Graph 1 – Comparison of Average Attendance per Match in the First Division



Source: Developed with data from *Jornal A Bola e As Finanças do Futebol Profissional*

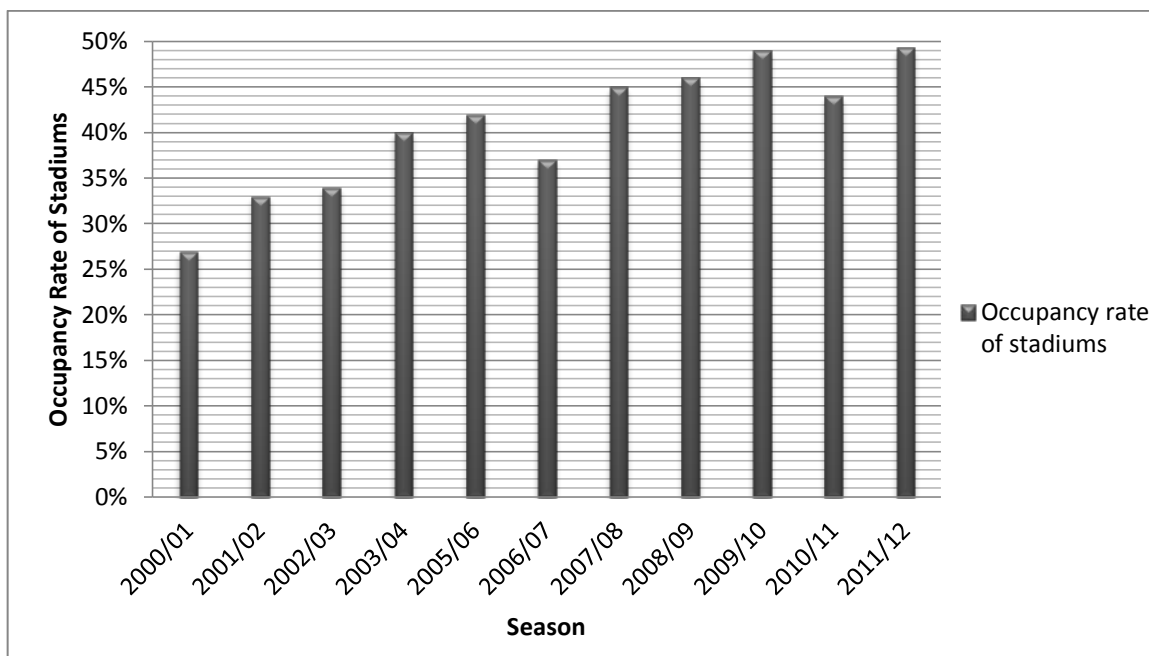
After the live football in Portugal hit bottom, we observe a very significant improvement. In 2001/02 season, the average per game is 6 765, a slight increase. This fact is justified by the ‘big three’, since they all passed the barrier of the average twenty thousand spectators per game. Three of the clubs in the Portuguese league (*Leiria, Beira-Mar and Santa Clara*) could not get even one thousand spectators in each match. The occupancy rate increased compare to the season of 2000/01, being of 33%, but remains below the levels achieved in the decades od 80 and 90 (Graph 2).

For the season 2002/03 keeps the trend of previous seasons, despite the increased difficulties in selling the tickets. The works in many stadiums preparing for the European Championship 2004, forced many teams to play in borrowed home grounds for all or part of the season. The barrier of thirty thousand spectators per match has been exceeded again in this season, which has not happened in Portugal for more than a decade. The team that contributed to this achievement was the *FCP*. Only one team (*Alverca*) was below the thousand spectators this season.

For the season 2003/04, there was a significant rise in the average attendance (9 588), an increase of around 35% compared to the previous season. This increase is due to four teams, *Guimarães* that after an average of 643 spectators in 2002/03, due to the rebuilding of it stadium, achieved an average of 10 650 spectators, and also once again the

‘big three’ with high averages per match¹⁵. With respect to the average occupancy rate of stadiums on the Portuguese premier league, in 2003/04 was 40% per match (Graph 2). This value is clearly below the expectations, due to the potential of sport and the investment on new stadiums with the revenues of the teams well underneath their full potential.

Graph 2 - Occupancy Rate of Stadiums in the First Division



Source: Developed with data from As Finanças do Futebol Profissional

In 2005/06, the trend remained, with average attendance close to ten thousand spectators per game, a value that can be found only one decade before. This fact may be totally explained on the ability to attract spectators by the ‘big three’ in home games. The average occupation this season is 4%.

In 2006/07, we observe a decrease in the average attendance, with about nine thousand spectators per game. The weight of the ‘big three’ continues to influence the average attendance and the occupancy rate is still too low considering the capacity of Portuguese stadiums. At this season neither team had below thousand spectators, despite the average occupancy has dropped compared to the previous season.

It should be stressed that there was a slight improvement over the last four seasons. All the four last seasons have average attendances above ten thousand spectators. In 2007/08 the average attendances exceed, for the first time in decades, the barrier of eleven

¹⁵ FC Porto: 42 827, SL Benfica: 35 430 e Sporting CP: 38 234

thousand spectators per match. This trend is due to the ‘big three’ but also to *Guimarães* with around twenty thousand spectators per match and *Braga* with about sixteen thousand spectators per game. But this slight improvement is still dependent on the attractiveness of the spectators of the ‘big three’ in their home matches. Currently, the attendances continue to fall short of the average values achieved by the Portuguese football in the 70s and 80s.

The 2011/12 seasons the one that has higher occupancy rates, though still below 50%, since the 80s and 90s. Although, the ‘big three’ continue to influence the average spectators in Portuguese football league.

We can observe in the Table 3 that the European Leagues feature value for the attendance far superior that recorded by the Portuguese league. Is a completely different reality from Portugal, since the rate of occupation of these stadiums is far superior to the Portuguese League.

Table 3 - Average Attendance, season 2010/2011

European League	Average Attendance
Ligue 1	20 000
Lega Calcio Serie A	24 000
Liga BBVA	28 000
Premier League	35 000
Bundesliga	42 000

Source: European Football Statistics (EFS)

This becomes a matter of concern, given the importance of football in Portugal. Therefore, measures should be taken to attract more attendance for Portuguese stadiums.

IV. Empirical Study

i. Model

In this empirical study, we use two models, following BORLAND (1987), to explain the determinants of attendance. The first model will be per match, i.e. the attendance used were collected match by match. The second model will be by fixtures, i.e. the attendances were collected by fixtures. The use of two models helps us understand the determinants of demand for attendance remain the same regardless of the form of aggregating the attendance

MODEL PER MATCH (A)

$$Att_{it} = \beta_0 + \beta_1 Real_{it} + \beta_2 UNA^2_{it} + \beta_3 UNA/Fix_{it} + \beta_4 UNC_{it} + \beta_5 UNC^2_{it} + \beta_6 Derby_{it} + \beta_7 Derby1_{it} + \varepsilon_{it} \quad (1)$$

Where, i is the number of match per fixtures, i.e. they are eight matches in thirty fixtures and t is the number of season (2006/07 to 2011/12).

MODEL PER FIXTURE (B)

$$Att_{it} = \beta_0 + \beta_1 Real_{it} + \beta_2 TV_{it} + \beta_4 UNB_{it} + \beta_5 U_{it} + \varepsilon_{it} \quad (2)$$

Where, i is the number of fixture and t is the number of season (2006/07 to 2010/11). The error (ε_{it}) is divided into two parts, the first (α_{it}) is designated individual effect and refers to the cross-sectional error. The second (η_i) is the error element combining time series and cross-sectional data (fluctuates from individuals and then through time, and the conventional error regressions), and assumes that this is not correlated with explanatory variables (iid).

ii. Description of Variables

To control different aspects that influence football attendance, we divide our variables into five groups: economic variables, uncertainty, incentives factors, expected quality and other variable.

ECONOMIC VARIABLES

PRICE

Theoretically, the demand equation should be estimated for each subgroup of spectators according to the price charged for each section of the stadium. However, since data are not available. We may use other composite price indices. Therefore, in this paper two prices indices are use. The first index used is the real minimum price (MINP) or price of admission, i.e. is the minimum price that clubs should charge for tickets for the period for 2006 to 2012. Since the demand measure does not aggregate quality of service, such as the comfort of the seats or parking, we can state that the minimum price is most appropriate for measuring the cost of participation.

The second index used is the *Real Average Price*, i.e. is the total revenue divided by the total attendance in that year. BORLAND (1987, p. 223) claim that:

“This measure is in fact equivalent to the weighted sum of the price paid by each class of spectators. Testing an average series in addition to the minimum price seems important because it is a composite of the price admission for both adults and children and may be more relevant therefore to a family making an attendance decision.”

Despite being an important variable for the definition of demand, we could not get the consolidated financial reports of all participating teams in the Portuguese league.

REAL INCOME (REALY)

The measure of income used is the national disposable income in Portugal, expressed in per capita. The expected sign of this variable will be positive, according to BORLAND (1987). The average income influences positively the attendance. However, according to BIRD (1982) and MORLEY et al. (1985) the sign on the real income may be also negative.

UNEMPLOYMENT (U)

Unemployment may cause a significant reduction in disposable income. This fact may influence the number of spectators in stadiums. However an equivalent, the high unemployment could influence positively the attendance, i.e. the attendance will be higher with increasing unemployment, because it can become a way to ease the frustrations of day-to-day. SANDERCOCK et al. (1981, p. 91) describes an audience for “many of whom football may have been the main escape from the unfair play of the capitalist system”.

UNCERTAINTY

UNCERTAINTY OF OUTCOME

In the literature, several methods are used to define the uncertainty of outcome. SLOANE (1975) makes a distinction between two types of uncertainty for English football: the long-term uncertainty of outcome with respect to the degree of predominance of the football league for a given group of clubs over several years and the short-term uncertainty of outcome respect the equal performance at a given season. The author also developed a categorization for the uncertainty of outcome: Game Uncertainty with regard to the predictability of individual competitions; Playoff Uncertainty with regard to the proximity of the league during the regular season, and Consecutive Season Uncertainty applies to the question of dynasties over time.

JENNETT (1984, p. 179) suggested another dimension of the problem, that focuses on the short-term dimension. He argued that “attendances are not generated only by the probability of victory of either club in any match, but by the significance of the game in the overall championship race”. In turn, DEMMERT (1973, p. 61) states that the uncertainty of outcome measures including specific performance of all league clubs can “ may exhibit a bias due to variations in the performance of teams clearly not in the pennant race.”

We will test a serie of measure of uncertainty of outcome. The first measure is, UNA that is difference between matches won by the first and second classified. The second measure is, UNB that is difference between matches won by the second last and the last classified. The last measure of uncertainty is the UNC, achieved is the points difference between the teams playing in each match, i.e. the lower the points difference between the teams, most attractive the match. All these measure are further processed in two measures, i.e. will put them to the square (UNA^2 , UNB^2 and UNC^2) and divided by the

number of fixtures (UNA/fix, UNB/fix and UNC/fix), since this may we may take all the information from the uncertainty variables.

INCENTIVES FACTORS

TELEVISION (TV)

The leisure products competing with football increased significantly in recent years, such as television, which appears as the main form of entertainment. Specifically, the repetition of few select football matches and live broadcast of other matches may have affect attendance in football stadiums. This effect can be justified in two ways. TV may stimulate the interest on going to the stadium or it can encourage armchairspectatorship¹⁶. The measure used in this study is the hours for week of football matches broadcast.

EXPECTED QUALITY

DERBY

The phenomenon of derby marches where rivalry is traditionally vociferous, may lead to a potential increase in attendance. In our model it is examined in the context of the ‘big three’ matches. Derby has a value of unity for derby matches involving clubs that have built a tradition of intense rivalry over the years and the value of zero otherwise. The three derbies of the Portugueses football are FCP vs. SLB (The Classic), SLB vs. SCP (Lisbon derby) e FCP vs. SCP.

DERBY1

In our model it is examined in the context for those games where teams share a common geographical boundary. Derby1 have a value of unity for matches between teams that are near geographically and the value of zero otherwise. The regional derbies are Porto vs. Boavista (Invicta Derby), Vitória de Guimarães vs. Sporting de Braga (Minho Derby), Vitória de Setúbal vs. Vitória de Guimarães (Victorian Classic), Marítimo vs. Nacional (Madeira Derby), Belenenses vs. Porto (Blue Classic), Olhanense vs. Portimonense (Algarve Derby), Beira-mar vs. Académica (Center Derby).

¹⁶ Term used by (BORLAND, 1987) to set the viewers who prefer to see the games of his team on their sofas at home.

OTHER VARIABLE

Other variables may be included in the analysis of the demand. However, due to the inexistence of data these variables are not included in our models. One of these variables is the *Hooliganism* has also been used as a measure of attendance in the context of British football matches (BIRD, 1982). This study BIRD (1982) and CARMICHAEL et al. (1999) do not considered hooliganism as a significant explanatory variable for attendance.

Another variable is the *Weather*, i.e. the weather conditions can determine the attendance on a sportive event. HYNDS et al. (1994) on British Cricket, found that when the rain causes the break in the game there is a very strong negative effect on attendance. Furthermore, the temperature or the sunshine are not preponderant in the attendance. Most British studies show that the rain and temperature did not significantly affect attendance in rugby or soccer matches (BIRD, 1982, CARMICHAEL et al., 1999). By contrast, American studies show that adverse weather conditions (such as rain or extreme temperatures) may negatively affect attendance at football and baseball matches (BUTLER, 2002, WELKI et al., 1999). The only study where weather conditions have a positive effect on attendance is GARCÍA et al. (2002). The effect of this variable becomes more important in cross-sectional analyses, since there is low variation between seasons in the total number of wet days. In the Table 4 presents the summary of variables:

Table 4 – Summary of Variables

Variables	Description	Source	Units
Economic Variables			
Minp	Minimum price that clubs should charge for tickets	LPF	Euros
Realy	National disposable income in Portugal, expressed in per capita	Pordata	Euros
Unemployment	Unemployment rate in Portugal	INE	%
Uncertainty			
UNA	Difference between matches won by the first and second classified	LPF	Number of matches
UNB	Difference between matches won by the second last and the last	LPF	Number of matches

	classified		
UNC	Points difference between the teams playing in each match	LPF	Number of points
UNA²	UNA squared	LPF	Number of matches
UNB²	UNB squared	LPF	Number of matches
UNC²	UNC squared	LPF	Number of points
UNA/fix	UNA per fixtures	LPF	Number of matches
UNB/fix	UNB per fixtures	LPF	Number of matches
UNC/fix	UNC per fixtures	LPF	Number of points
Incentives Factors			
TV	Football matches broadcast	MarkTest	hours for week
Expected Quality			
Derby	value of unity for derby matches involving clubs that have built a tradition of intense rivalry over the years and the value of zero otherwise	LPF	
Derby1	value of unity for matches between teams are near geographically, or are derby at regional level and the value of zero otherwise	LPF	

Source: Developed with variables

The analysis begins with the observation of the behavior of the variables used in the panel model. The Table 5 and Table 6 shows the descriptive statistics of the variables used in econometric models with mean, standard deviation and the expected impact of the variables.

Table 5 - Descriptive Statistics and Expected Impact of Variables (Attendance per Match Model)

	Mean	Standard Deviation	Min	Max	Expected Impact
ATT	10390.01	13397.52	50	64103	

Economic Variables					
Real Income	3186.78	72.31	3057.77	3327.39	+/-
Uncertainty					
UNA^2	7.22	14.01	0	81	-
UNA/fix	0.06	0.065	0	0.30	-
UNC	0.29	13.69	-55	48	-
UNC^2	187.39	347.98	0	3025	-
Expected Quality					
Derby	0.03	0.16	0	1	+
Derby1	0.04	0.187	0	1	+

Source: Developed with data

We can observe that the attendance has an average of about ten thousand spectators per game in the six seasons under analysis, verifying a significant variation.

Table 6 - Descriptive Statistics and Expected Impact of Variables (Attendance per Fixtures Model)

	Mean	Standard Devition	Min	Max	Expected Impact
ATT	81725.01	27225.85	8670	154982	
Economic Variables					
Real Income	3199.38	67.22	3060.44	3327.39	+
Unemployment	9.24	1.60	7.30	12.4	+/-
Uncertainty					
UNB	0.79	1.14	-1	4	-
Incentives Factors					
Television	104.77	4.46	94	121	+/-

Source: Developed with data

The average attendance is about eighty-two thousand viewers per fixtures in five seasons under analysis, verifying a significant variation.

iii. Methodology

According to HSIAO (1986), models for panel data offer a number of advantages over the cross-sectional or the time series models. The advantage is that these models control better for the heterogeneity present. The use of panel models allows controlling the effects of unobserved variables. Some characteristics affect the variable to be explained, but are difficult to be measured. The omission of these variables from the model generates biased results.

Another advantage of panel data is to allow the use of more observations, increasing the number of degrees of freedom and reducing the collinearity between the explanatory variables (HSIAO, 1986). In the presence of multicollinearity becomes difficult to establish whether an individual regressor influences the dependent variable. By eliminating this problem one may have estimation of the parameters with better quality. Panel data models are able to identify and measure effects that are not possible to be detected through analysis of cross-sectional data or time series alone (GREENE, 2011).

However, panel data also have some limitations. According to HSIAO (1986), panel data models require a large number of observations and therefore are more difficult to implement. Generally, panel data models covers a small period of time, due to the high cost of obtaining new information or unavailable information in the past. However, it is desirable that the number of observations is large. Because, the estimated parameters are asymptotically consistent when the time period is small, the property of consistency only is fulfilled if the number of units is large.

The estimation of panel data models can be made using Pooled models, with Fixed Effects (FE) and with Random Effects (RE). The aim is to isolate the effects of heterogeneity and reduce complications resulting from the omission of variables in the model. The choice of the best model is based on the Hausman test.

Pooled OLS is analogous to cross-section OLS estimation. It uses different points in time for the same unit in the sample, thus allowing an increase of the sample size. It leads to more precise estimators and more robust statistical test. The pooled do not take into account individual changes over time. We can say that the method applied for each individual observed for all variables in each time period, quite independently, loses information in the estimation. This model is appropriate, for the relationship between the

dependent variable and some explanatory variable, where at least some of them remain constant over time (WOOLDRIDGE, 2003). Therefore, this estimation is designed for larger samples, but neglects the individual heterogeneity on the unobserved effect specific to groups (GREENE, 2011).

The Fixed Effects model assumes that the differences between the cross-section are caught in a constant term (GREENE, 2011). Thus, it is assumed that the intercept fluctuates from one individual to another but is constant over time, so the response parameters are the same for all units and for all time periods. The advantage of this model is that considers the variation of explanatory variables for each unit independently, thus capturing the specific characteristics of each unit on the individual heterogeneity.

The Random Effects model has the same assumptions of the fixed effects model, i.e. the intercept fluctuates from one individual to another, but not over time. The difference between the two models is the treatment given to the intercept. The RE model includes the unknown individual effects on the error term. Thus, the error (ε_{it}) form contains two components: the specific error (α_{it}), corresponding to each individual effect and representing the error (η_i) element combined time series and cross-sectional. With the purpose of obtaining efficient estimators, the estimation is performed using the GLS. If the unobservable effect is uncorrelated with the explanatory variables, then the RE proves to be the best alternative (WOOLDRIDGE, 2003).

V. Empirical Results

The variable MINP was removed of the models due to the presence of colinearity. This is also the use in various other studies. PEEL et al. (1992) and FALTER et al. (2000) found that the minimum price was not sufficiently variable and was not included in the analysis. The ticket price is the result of different prior interactions between demand and supply of football. In Portuguese it seems that the clubs behave as discriminating monopolies, since they are able to modify the prices according to the expected attendance (FALTER et al., 2000).

i. Model per Match (A)

The results of the regression, which used the variables mentioned in the methodology, are described in Table 7. Out of the 15 variables initially included in the model, only 7 are present in the final model, which was reached after the completion of various interactions between variables in order to find a robust model.

The Table 7 shows the results of the panel model (Fixed Effects, Random Effects). The Hausman Test with a $\chi^2 = 25.60$ with a $p - value = 0.0003$, shows that it is appropriate to use the fixed effects model.

Table 7 - Static panels regression explaining attendance per match

	Fixed Effects	Random Effects
Constant	-31982.33** (12593.81)	-32926.77*** (12733.56)
Economic Variables		
Realy	12.60*** (3.99)	12.89*** (4.04)
Uncertainty		
UNA ²	99.81* (53.30)	102.13* (53.89)
UNA/fix	-27972.33** (11890.13)	-28902.50** (12020.96)

	Fixed Effects	Random Effects
UNC	401.15*** (19.09)	399.72*** (19.26)
UNC ²	10.89*** (0.77)	11.26*** (0.78)
Expected Quality		
Derby	36841.95*** (1678.96)	37597.43*** (1691.04)
Derby1	3798.82*** (1403.06)	3428.82** (1414.19)
N(observations)	1440	1440
R-sq (Within)	0.44	0.44

Source: Search results

Values in parentheses refer to standard deviation.

***, **, * Significance at 0.01, 0.05 and 0.10 level

After defining the use of the fixed model, the modified Wald test for group-wise heteroskedasticity in fixed effect model $\chi^2 = 54.38$ with a $p - value = 0.0000$, the null hypothesis was rejected at 5%, showing the presence of heteroscedasticity. The Wooldridge test autocorrelation in panel data $F = 0.6448$, with a $p - value = 0.4473$, cannot reject the null hypothesis then the data does not present autocorrelation.

In order to allow the correction of standard errors in panel analysis, the analysis presented here is based on BECK et al. (1995). They suggest the use of the regression model with *Prais-Winsten panel corrected standard error model (PCSEs)*. This model is also appropriate because “correct” problems of heteroscedasticity and autocorrelation (GREENE, 2011). We use this correction method because against all possible models of error correction was the one that seems most appropriate.

We performed static PCSEs, where the results can be seen on Table 8.

Table 8 – PCSEs regression explaining attendance per match

PCSEs	
Constant	-33290.97*** (12756.16)
Economic Variables	
Realy	13.00*** (4.05)
Uncertainty	
UNA ²	103.03* (53.99)
UNA/fix	-29261.28** (12029.03)
UNC	399.16*** (19.85)
UNC ²	11.41*** (0.80)
Expected Quality	
Derby	37888.07*** (1812.75)
Derby1	3300.85** (1331.96)
N(observations)	
	1440
R-sq	
	0.44

Source: Search results

Values in parentheses refer to standard deviation.

***, **, * Significance at 0.01, 0.05 and 0.10 level

Real income seems to have a positive and significant effect on attendance. The elasticity indicating that football attendance is a luxury good. It is possible that as real incomes rise spectators are more likely to attend matches at clubs with a sustained period of success.

$$\eta_r = \frac{dQ_x}{dR} * R/Q_x = 6.03$$

Concerning the variables of uncertainty, being all significant, we conclude that all variables included in the model that only the UNA/fix shows the expected signal, i.e. the bigger the difference between the matches won between the two teams, less attendance in the stadium. Thus, the uncertainty of the result shows us that the more balanced are the teams on a given match further attendance will come to the stadium.

The quality variables seem to have the expected signal and significant, supporting the theory that the derby attracts more spectators to the stadium. The dummy Derby seems to have a stronger impact in attendance than the dummy Derby1. Therefore the more rivalry there is between the teams more people will travel to the match. In Portugal, this phenomenon can be seen in any match between the so-called ‘big three’, as they are crucial matches in the championship. In turn, the impact of regional dummy (derby1), is not as strong since the fans who travel to the stadiums in this case, do not expect that the match determines the championship.

ii. Model per fixtures (B)

The results of the regression, which used the variables mentioned in the methodology, are described in Table 9. Out of the 15 variables initially included in the model, only 4 are present in the final model, which was reached in order to find a robust model.

Table 9 shows the results of the panel model (Fixed effect, Random effects). The Hausman test with a $\chi^2 = 0.83$ with a *p* – value = 0.9346, shows that it is appropriate to use the random effects model.

Table 9 – Static panels regression explaining attendance per fixtures

	Fixed Effects	Random Effects
Constant	-405135.70** (181919.00)	-422852.50*** (120267.30)
Economic Variables		
Realy	112.34*** (31.96)	114.87*** (30.87)
U	5331.78 (12577.08)	5133.47*** (1708.38)
Uncertainty		
UNB	-2719.73 (1981.67)	-3147.12* (1864.23)
Incentives Factors		
Tv	766.47 (487.55)	878.91* (458.15)
N(observations)	150	150
R-sq (Within)	0.10	0.10

Source: Search results

Values in parentheses refer to standard deviation.

***, **, * Significance at 0.01, 0.05 and 0.10 level

The test robust tests for equality of variance (robvar)¹⁷ does not detect the presence of heterocedasticity. The Wooldridge test autocorrelation in panel data $F = 8.45$ with a p -value = 0.0069, detects the presence of autocorrelation. In order to correct autocorrelation we use of the regression model with *Prais-Winsten panel corrected standard error model (PCSEs)*, since this model solves the problems of autocorrelation and heteroscedasticity (BECK et al., 1995, GREENE, 2011).

We performed static PCSEs, where the results can be seen on Table 10.

¹⁷ robvar reports Levene's robust test statistic (W0) for the equality of variances between the groups defined by groupvar and the two statistics proposed by Brown and Forsythe that replace the mean in Levene's formula with alternative location estimators. The first alternative (W50) replaces the mean with the median. The second alternative replaces the mean with the 10% trimmed mean (W10).

Table 10 - PCSEs regression explaining attendance per fixtures

PCSEs	
Constant	-397121.00*** (144423.30)
Economic Variables	
Realy	110.48*** (37.27)
U	5302.56*** (1511.77)
Uncertainty	
UNB	-3021.79* (1587.97)
Incentives Factors	
Tv	743.74 (484.23)
N(observations)	150
R-sq	0.11

Source: Search results

Values in parentheses refer to standard deviation.

***, **, * Significance at 0.01, 0.05 and 0.10 level

The Real Income has a positive and statistically significant coefficient. The elasticity indicating that football attendance is a luxury good. It is possible that as real incomes rise, spectators prefer to watch match with a competitive interest.

$$\eta_r = \frac{dQ_x}{dR} * \frac{R}{Q_x} = 4.44$$

Unemployment shows a positive and significant coefficient, indicating that the Portuguese people despites being unemployed found in football a form of entertainment.

Regarding the variable of uncertainty, we found that the variable UNB presents the signal expected, i.e. the higher the difference between match won by the penultimate and the last classified, lower the attendance in the stadium. This implies that the relegation

affect attendance, i.e. if a match is significant for the relegation more spectators in the stadium.

Concerning the incentive variable, it seems to have a positive and significant coefficient, i.e. the fact that a game is broadcast on television may encourage spectators to go to stadiums.

iii. Model A and B

Looking at the two models together, we find that only the income variable and the uncertainty determine the attendance demand. Since the income is equally important in both models. In turn, the uncertainty variable has more importance in the model A, i.e. the more uncertainty there is in a match more spectators go to the stadiums. The individual match has quite an impact on attendance, because an individual match can be decisive in the season.

The use of the two models shows us that when we use the model A, we get more information, i.e. we can define more determinants of demand.

VI. *Conclusion*

To understand the reasons that lead to the absence of spectators at Portuguese stadiums, it became important to establish connections between a set of reasons that contribute to this gap. One of the main reasons for this gap are the economic and financial issues, i.e. lack of purchasing power to regularly buy tickets to the matches, considered too expensive for the Portuguese standard of living. In conjunction with the intense television coverage of football, this often replaces the experience of seeing a “live” match. The concentration of supporters in the “big three” draws opportunities of developing of the smaller teams.

These arguments help us understand the reasons why the Portuguese people go less and less to a stadium. Thus, the final aim of this research is to identify the main determinants of the demand in the Portuguese Football League, using a sample for individual games and fixtures during the seasons 2006/07 to 2011/12 and 2006/07 to 2010/11, respectively.

The models explain a significant portion of the attendance data, based on economic variables, the uncertainty of the result, incentive factors and expected quality.

In the model for matches, a strong positive relationship observed between the economic context of the country and the attendance (national disposable income is positive). Uncertainty of outcome is important to fans it seems, not so much because of the excitement a close race produces per se, so much as for the associated prospects of championship success. It is visible the importance of the ‘Big three’ through the variable Derby, since this has a strong significance.

In the model by fixtures, there is the same strong positive relationship between the economic context of the country and the attendance. The positive sign of unemployment claims that indeed football in Portugal is a way to soften the situation of the country. Watching the TV signal, we found that after the Portuguese stadiums are not ‘empty’ due to broadcast of the matches, instead states that the transmission of the matches means that more people will watch at the stadium.

The real income explains the football attendance, so the team managers should expect a lower attendance in a downturn of economic activity.

In sum, the analysis of the Portuguese football league shows that the use of traditional economic instruments can provide an interesting perspective on football. However, there are limitations to a thorough analysis of the Portuguese football demand.

Further research, involving possible refinements to the measurement of demand incorporated the prices, both minimum prices as well average prices, could lead to the development of a model capable of determining more recently the demand for Portuguese football league.

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Appendix

Table 11 - Attendance on Sports (Empirical Papers)

Study	Sport	Country	Type of Study
DEMMERT (1973)	Baseball	USA: Major League	OLS; Seasonal home attendance and Seasonal home attendance per capita; Seasons (1951-1969)
NOLL (1974)	(a) Baseball (b) Basketball (c) Football (d) Hockey	USA: (a) Major League; (b) NBL; (c) NFL; (d) (also Canada) NHL	(a) Panel; attendance per season by home team; 23 teams; 2 years (1970–71). (b) Panel; average attendance per game by season by home team; 2 years (1969/70– 1970/1). (c) Cross-section (1968, 1970); total attendance by home team. (d) Cross section (1972/3); average attendance per match
HART et al. (1975)	Soccer	England: First Division	Panel; attendance per match by home team; four teams; three seasons (1969/70–1971/2)
SIEGFRIED et al. (1980)	Baseball	USA and Canada: Minor League	OLS; Attendance (log); Seasons (1973-1977)
SANDERCOCK et al. (1981)	Football	Australian: AFL	
BIRD (1982)	Soccer	England: English Football League	Time-series; total attendance per season; 32 seasons (1948/9–1979/80)
JENNETT (1984)	Soccer	Scotland: Scottish Football League	Panel; attendance per match; six seasons (1975/6–1980/1)
MORLEY et al. (1985)	Australian football	Australia: VFL	Time-series: Attendance
BORLAND (1987)	Australian football	Australia: VFL	Time-series; average attendance per match by season; 37 seasons (1950–86)
CAIRNS (1987)	Soccer	Scotland: Scottish Football League	OLS; Adult and Juvenile attendance per match; Seasons (1971/80)
DOMAZLICKY et al. (1990)	Baseball	USA: Major League	OLS; Attendance per opening (log); Season (1984)
BORLAND et al. (1992)	Australian football	Australia: VFL	Panel; attendance per match; 132 matches; six seasons (1981–

Study	Sport	Country	Type of Study
			6)
DOBSON et al. (1992)	Soccer	England: English Football League, Divisions 1–4	Panel (1989/90–1990/1); attendance per match; 795 matches
PEEL et al. (1992)	Soccer	England: English Football League	Cross-section (1986/87); attendance per match; 1,506 matches
HYNDS et al. (1994)	Cricket	England: Test matches	Time series (1984–92); attendance by day; 54 matches
BAIMBRIDGE et al. (1995)	Rugby League	England: British Rugby League	Cross-section (1993/4); Attendance per match; 240 matches
WILSON et al. (1995)	Soccer	Malaysia: Semi- pro League	Panel; attendance per match; three seasons (1989–91)
BAIMBRIDGE et al. (1996)	Soccer	England: Premier League	Cross-section (1993/94); attendance per match; 462 matches
SIMMONS (1996)	Soccer	England: English Football League	Panel; average attendance per match by season; 20 teams; 44 seasons (1948–91)
BAIMBRIDGE (1997)	Soccer	European Championship 1996	Cross-section; total attendance per match; 31 matches
KAHANE et al. (1997)	Baseball	USA: Major Leagues	Panel; average attendance by season ; 26 teams; three seasons (1990–2)
CARMICHAEL et al. (1999)	Rugby League	England: British Rugby League	Cross-section (1994/5); attendance per match; 480 matches
WELKI et al. (1999)	Football	USA: NFL	Cross-section (1986 and 1987); attendance as proportion of sold tickets; 392 matches
FALTER et al. (2000)	Soccer	France: Premiere Division	Cross-section (1997/98); attendance per match; 306 matches
BUTLER (2002)	Baseball	USA: Major League Baseball	Cross-section (1999); attendance by match; 2,428 matches
GARCÍA et al. (2002)	Soccer	Spain: First Division League	Panel; tickets sold per match (excluding season tickets); four seasons (1992/3–1995/6)
FORREST et al. (2002)	Soccer	England: Premier League	Cross-section (1997/8); attendance per match; 872

Study	Sport	Country	Type of Study
PRICE et al. (2003)	Football	USA: College Division 1A	matches Cross-section (1997); Attendance per match; 577 matches
AHN et al. (2007)	Baseball	USA: Major League	OLS FE Panel Two step – GMM (IV); Attendance growth rate (log); Season (1969 - 2000)
LEMKE et al. (2010)	Baseball	USA: Major League	censored normal regression with home-team fixed-effects; Individual game attendance; Season (2007)
JEWELL (2012)	Soccer	England: Premier League	Probit; 5 Season (2004/2-2007/8)