

*Department of Communication, University of Teramo*

**wpcomunite.it** ●●●○○○

**Competitive balance and TV audience: An empirical  
analysis on the Italian Serie A**

**Marco Di Domizio**

*Department of Communication, Working Paper No 64, 2010*

### **Department of Communication Working Paper Series.**

The Department of Communication Working Paper Series is devoted to disseminate works-in-progress reflecting the broad range of research activities of our department members or scholars contributing to them. It is aimed at multi-disciplinary topics of humanities, science and social science and is directed towards an audience that includes practitioners, policymakers, scholars, and students. The series aspires to contribute to the body of substantive and methodological knowledge concerning the above issues. Since much of the research is ongoing, the authors welcome comments from readers; we thus welcome feedback from readers and encourage them to convey comments and criticisms directly to the authors.

Working papers are published electronically on our web site and are available for free download (<http://wp.comunite.it>). Each working paper remains the intellectual property of the author. It is our goal to preserve the author's ability to publish the work elsewhere. The paper may be a draft that the author would like to send to colleagues in order to solicit comments or feedback, or it may be a paper that the author has presented or plans to present at a conference or seminar, or one that the author(s) have submitted for publication to a journal but has not yet been accepted.

# Competitive balance and TV audience: An empirical analysis on the Italian Serie A

Marco Di Domizio

University of Teramo – Italy

## *Abstract*

This paper investigates the behaviour of the “*couch potato*” audience in regards to the Italian Football League - *Serie A* - during the 2008/09 season. Using data from 380 matches, we considered a collection of variables suitable to influence the share of TV audience of satellite television. According to the standard prescriptions of sports economics literature and assessing peculiarities of Italian context, we estimated the “Football on TV’s” demand by an OLS regression model. Rating the dependent variable of TV audience by the share registered in each match, we introduced a set of independent variables in order to approximate match quality, the programme schedule placement, the follow-up of the involved teams and their rank. As other theoretical and empirical investigations have focused on Spanish and English championships, our attention concentrates particularly on the relationship between the *closeness of the game* and the television audience. In the regression model, uncertainty of outcome has been measured extracting information from the Italian fixed odds betting market. We found that all the theoretical expected relationships have been confirmed by the econometric analysis. In spite of the statistical significance of the outcome uncertainty on share, the estimation points out that more than 90% of variability concerning TV audience has been explained net of uncertainty factors and that the impact of a closest context on dependent variable is marginal. The overestimation of the role of match uncertainty on TV audience could support the opinion of top team’s management opposing the return to the collective bargaining of TV rights starting from next season, 2010/11, fixed by the law 9/2008 of Italian Parliament. In football context the competitive balance should then be considered a “meritorius good”, far from market assessment.

---

I’m grateful to Andrea Ciccarelli and Raul Caruso for helpful comments and suggestions, to Aida Corvelli for her language support and to all participants to the ATINER 10<sup>th</sup> Annual International Conference on Sports, May 2010, Athens.

## 1. Introduction

The analysis of the symbiotic relationship between media and professional sports leagues is one of the most debated topics in sports economics literature. A large part of books, papers and articles on this subject concentrates on three potential threats/opportunities in the live broadcasting of sports events – team revenues, competitive balance and long period league structure.<sup>1</sup> Until the end of the 80's these arguments were almost an exclusive of the American sports professional context since the sphere of influence of TV broadcasters on European sports was limited to only some big events at international level. In 1992, the change from *English Football League (EFL)* to *English Premiere League (EPL)* disclosed the idea that the former issues would not have been relegated as per American sports debates. The reform of English football was explicitly introduced in order to increase the power of larger clubs in TV rights' bargaining, taking into account the new opportunities opened by the diffusion of new technologies in TV programming.<sup>2</sup> It was only the first step toward a period of deep changes in the European sports leagues, especially in the world of football. The revolution involved the Italian Football League too, including both financial and organizational features. From a financial point of view, in the last decade, the production value of the Italian football industry (the aggregate revenues of all teams in the four professional divisions) increased more than twofold from about €870 million in 1997 to €1,752 million in 2006 (current value).<sup>3</sup> The rise was generated by the growth of the commercial value of TV rights that, at present, accounts on average for more than 50% of the total teams' revenues.<sup>4</sup> The Italian teams competing in *Serie A* increased exponential TV revenues thanks to the opportunity of individually negotiating part of the TV rights after the declaration of the Italian antitrust authority (AGCM) in 1999 that imposed the League to stop the collective bargaining of non-free-to-air rights.<sup>5</sup> This caused a radical change in the organization of professional football teams' revenues, reducing the share of gate attendance in *Serie A* from 1/3 in 1998 to 1/8 of the total revenues in 2006. Broadcasting revenues have become the main source of all Italian football teams, mainly for those competing at

---

<sup>1</sup> See, from others, the collection of papers in Jeanrenaud and Kesenne (2006), chapter 3 in Fort (2006), chapter 6 in Sandy, Sloane and Rosentraub (2004) and Noll (2007).

<sup>2</sup> For a brief history of televised sport in the United Kingdom see section 2.5 in Dobson and Goddard (2001) and chapter 8 in Downward and Dawson (2000). For financial aspects of *EPL* see Gerrard (2006).

<sup>3</sup> Using Consumer Price Index (CPI) from Italian Institute of Statistics (ISTAT) the ratio between total revenues of the two years at constant prices is 1.66.

<sup>4</sup> For a discussion on the financial and commercial outlook of the Italian Football League see Venturelli (2009) and Nicolliello (2008).

<sup>5</sup> For an exhaustive juridical survey on Italian TV rights history see Figus Diaz and Forti (2008) and Tonazzi (2003).

international level. A recent study based on data from the 2008/09 season, focused on the financial performance of the European football industry, revealing that broadcasting revenues account for more than 58% for Italian top teams versus a value of 38.75 % for other 16 non-Italian teams.<sup>6</sup> The transition has brought about political and organizational dilemmas, social tensions and legislative interventions aiming to organize the transformations in progress, often without success.<sup>7</sup>

The financial viewpoint concentrates on the opportunities offered to the professional teams by the TV's entrances and the economic literature focused mainly on two topics associated to the binomial "Sport and Television". The first relates to the potential *crowding-out* effect on gate attendance induced by the transmission of live matches. The second refers to the different preference structure that ought to characterize TV audiences respect to the stadium spectators. As suggested by Szymanski (2001) those issues should not be considered mere scientific curiosities. The second one in particular, aiming to capture the presumed *uncommitted* nature of TV audiences unlike the *committed* nature of stadium fans, has relevance in terms of policy in respects to the effects that more or less balanced competition could have on the whole football environment. Since TV assumed a crucial role in determining not only the financial and organizational behaviour of professional teams and Leagues, but also the physical and technical performance of players associated to the frequency and set-time of matches, it is impossible to think of leading those changes without taking into account the preference of key users towards football products: the *couch potato* audience. The relevance is amplified by the observation of two phenomena that seems to characterize the Italian *Serie A* from the early 90's: a general reduction in gate attendance combined with an increase of competitive unbalance.<sup>8</sup> According to the seminal contributions of sports economists<sup>9</sup>, the competitive balance plays a key role in the success of the leagues influencing the appeal of the sporting context; obviously, the competitive balance depends on the resources available for each single club. The data from the 2007/08 season in *Serie A* shows that more than 40% of total resources from TV rights were shared by the top 3 teams: this means that more than €263 million was paid to Juventus, Milan and Inter, while the remaining part (about €400 million) was divided among the other 16 teams.<sup>10</sup> This has a part

---

<sup>6</sup> Deloitte, *Spanish Masters – Football Money League*, March 2010, available on [www.deloitte.co.uk](http://www.deloitte.co.uk).

<sup>7</sup> For a thorough examination of this subject at European level see Hoen and Szymanski (2001). For the Italian context see Beha and Di Caro (2006), Tavella (2006) and Boeri and Bisoni (2009).

<sup>8</sup> See Di Domizio (2007). On to the competitive balance in *Serie A* see also Haan, Koning and Van Witteloostuijn (2008) and Brandes and Franck (2007).

<sup>9</sup> See Neale (1964), El-Hodiri and Quirk (1971).

<sup>10</sup> Special thanks to Giuseppe Marotta, General Manager of U.C. Sampdoria, for data on TV rights.

in the talent distribution over the teams: in the previous season (2008/09) the top 3 teams paid more than 46 per cent of the League's aggregate wages and this share has not reduced in the current season (2009/10). What has been the role of television in determining this situation? Is television responsible for the reduction of competitive balance? If so, does television disclose threats of a decreasing appeal toward Italian Football?

To reply rigorously to these questions it would be the case to highlight other circumstances. Firstly, the idea of a great appeal due to an increase of competitive balance, with references to football events at the gate attendance level, has not been undoubtedly confirmed on empirical ground. As we discuss later, regarding the relationship between closeness of the game and gate attendance it is suitable to assume several functional forms and derivative signs, not always in the expected directions.<sup>11</sup> Secondly, is it certain that TV crowds-out gate attendance? Thirdly, as Jeanrenaud and Kesenne wonder: "*Are demand determinants for televised sport the same as those for live attendance?*"<sup>12</sup>

Our paper is mainly focused on the third question. We used econometric tools to investigate the relationship between TV audience and a set of variables in order to analyse their impact on *couch potato* preference using OLS estimation. This paper is outlined as follows: section 1 resumes briefly the literature regarding the relationship between Sport and Media, section 2 concentrates on this topic referring to the Italian football context, section 3 describes the variables used in our estimates and section 4 discusses the main results. Section 5 concludes the paper.

## **2. Sport and TV: an overview**

As abovementioned, there is widespread literature on the role played by broadcasters in determining the organizational features of sports events, particularly in the USA – birthplace of professional sports. The relationship between media and sports events has always been a key topic to analyse. Currently, the top four professional Leagues (NFL, NBA, MBL and NHL) owe their organizational patterns to the 1961 Sport Broadcasting Act that granted some exceptions to the antitrust rules involving other industries. This decision was adopted in order to respect the fan interest by protecting competitive balance and league survival.<sup>13</sup> Neglecting

---

<sup>11</sup> See Borland and Macdonald (2003), Villar and Guerrero (2009).

<sup>12</sup> Jeanrenaud and Kesenne (2006, p. 3).

<sup>13</sup> An opposite viewpoint is expressed by Perlasca (2006).

law, economical and political issues that determine the vital role of TV on American professional sports, our attention turns to two questions widely debated upon in economic literature. Firstly, on the presumed crowding-out effect that live televised matches have on gate attendance; this question is not very simple. Surely a certain degree of substitution exists between televised and live matches<sup>14</sup> and at the same time the opportunity to reach a widespread audience over the local market has a promotional impact, that cannot be neglected, on gate attendance perspective. From the soccer leagues' point of view, several authors tried to settle the question, Baimbridge, Cameron and Dawson (1996) analysed the impact of live transmission concerning the 60 (on a total of 462) *EPL* matches played in the 1994/95 season highlighting, on average, a gate attendance reduction of 15%. They focused on two topics: the negative influence of televised matches on gate attendance was relevant only on Monday and that the losses in revenues for each single team due to gate attendance crowding-out should be marginal respect to the financial contribution shared by teams for their TV appearance. Forrest, Simmons and Szymanski (2004) investigated the behaviour of attendance in *EPL* and First Division from 1992/93 to 1997/98 estimating a maximum crowding-out effect for Monday night matches around 9% in Premiere League (more then compensated by the facility fees paid by B SkyB) and a larger negative impact (between 10 and 18 per cent) in the First Division under free-to-air coverage. Forrest and Simmons (2006) approached the problem changing perspective and concentrating on the presumed "cannibalisation" of *EPL* and *European Cup* versus the other three Football League divisions in England. They support the idea of a strong crowding-out effect on gate attendance of about 21 and 16 per cent, respectively for Division 2 and Division 3, for matches played simultaneously with Champion League games involving British clubs. Furthermore, Buraimo, Forrest and Simmons (2006), focusing on the 2<sup>nd</sup> Tier of the four English professional leagues, estimated a negative impact of about 23 per cent of the free-to-air televised matches and about 5 per cent of those broadcasted on satellite television. More recently, Allan and Roy (2008), in a study on the Scottish League, measured a negative impact of televised matches on home-fans gate attendance of about 30%. Garcia and Rodriguez (2002) estimated for the Spanish *Primera* division a consistent negative impact of televised matches on gate attendance of 33 per cent for free-to-air broadcasted matches and 45 per cent for matches transmitted on satellite television. Buraimo and Simmons (2007) estimated for the same

---

<sup>14</sup> A noted example reported in many textbooks refers to the Philadelphia Eagles which suffered a reduction in gate ticket sales of about 50% in the 1948 season after the decision to televise all their home games, inducing the NFL to adopt the "black out" rule for not sold out matches. See Leeds and Von Allmen (2005).

League, although for different periods, a small negative impact of the televised matches on gate attendance of 5 per cent on weekdays and of 3 per cent during the weekends, but only for public television coverage. On the contrary, no statistically significant negative impact of cable or satellite transmissions emerged. Out of Europe Santana and Stamford (2009) found no statistical significance of the substitution attitude of televised matches on gate attendance in regards to the Brazilian Championship.

A second aspect on which sports economists concentrate their attention, analysing the relationships between football and television, refers to competitive balance, particularly on the impact of uncertainty on televised events. Actually, the attention devoted to the interaction between competitive balance and sports events appeal is rather remote. Even Neale (1964), in a key contribution to sports economics, referring to the famous *Louis-Schmelling* paradox, pointed out the relevance of closing contexts in order to reach and confirm success, not only for a single event, but for the whole league. This common opinion is based on the hypotheses that a less uncertain context is detrimental for fan interest inducing a reduction in gate attendance, magazines sales, TV audience, merchandising activities and so on, until a worst case scenario, team and League death. From this point of view great efforts of sports economics literature have been devoted to test this hypothesis on empirical ground. Several contributions focused on the attitude of the closeness context to increase gate attendance. A partial survey is reported by Szymanski (2003), while a more inclusive one is reported by Borland and Macdonald (2003) and the most recent contribution by Villar and Guerrero (2009). Those surveys discuss results from appearing quite heterogeneous, not only among different sports and/or different leagues, but also inside the same leagues depending on the variables chosen as a proxy for the competitive balance and on the econometric tools used. Briefly, according to the survey of Borland and Macdonald investigating the effect of uncertainty on seasonal and match gate attendance, for different sports, only 15 out of 39 empirical works confirmed a significant and positive relationship. Focusing the analysis on football (12 out of 39), in 5 papers this latter former was confirmed while the remaining 7 showed quadratic relationships (in U-shaped form) or even a negative sign. On this ground, the call for an introduction of measures aiming to maintain competitive balance within the leagues could not be supported by invoking the strict preferences of gate spectators for uncertain contexts.

The empirical literature that has focused on the relationship between uncertainty and television audience has been less researched: this for two reasons. First because the opportunity offered by the new cable platforms to European fans to watch their teams live on



TV during the tournaments is fairly recent and second because the lack of data available at disaggregate (single match) level. Among others, Forrest, Simmons and Buraimo (2005) focus on the relevance of uncertainty both for TV management broadcasting strategies and for audience decision on which match to watch, introducing a new measure of outcome uncertainty based on the points per-game achieved by the teams corrected by the home advantage calculated from the previous season. From the *couch potato* audience perspective they conclude that “*outcome uncertainty does matter for the English Premier League [...] but only up to a point*” (p.660). Buraimo and Simmons (2007), in the cited paper focused on the Spanish League, supported the outcome uncertainty hypothesis for TV audience, with the exclusion of matches involving Barcelona, attributing this attitude to the fact that “*Television viewers will contain a large group of spectators who have at best a loose affinity to either team and prefer to see a close game*” (p.18). Using the words of Gerrard (2006, p.34-35) we can conclude that “*in order to assess the practical policy implications of the economic analysis of competitive balance, there is a better understanding of the determinants of fan demand [...] future research needs to clarify the nature and behavioural significance of the concepts of uncertainty of outcome, competitive balance and contest significance [...] differentiating between team fans and game fans in the analysis of the demand behaviour of sports fans*”.

### **3. Football and Television in Italy: a brief historical synthesis**

The organizational patterns of Italian football observed, in the last two decades, deep changes, inducing observers to coin the slogan “From Game to Business”.<sup>15</sup> This in order to emphasize the role of the financial flaws shared out particularly in the Italian *Serie A* due to a series of revolutionary phases corresponding to the entrance of new broadcasting platforms in the early 90’s: respectively *pay-tv* in 1993, *pay-per-view* in 1996 and the attribution by the Antitrust Authority of *pay-per-view*, *pay-TV* and *international* rights to each single team in 1999.<sup>16</sup> These changes offered Italian fans, for the first time, the opportunity to watch live matches on television even in different times and ways. At the beginning, from 1993 to 1996, this opportunity was restricted to one or two matches of which each round was played in advance

---

<sup>15</sup> See Lago, Baroncelli and Szymanski (2004).

<sup>16</sup> On the role played by the television in determining the current configuration of Italian and other European leagues see Andreff and Bourg (2006).

on Saturday night or postponed on Sunday or Monday night in respects to the traditional fixed time on Sunday evening. From 1996 the entrance of the *pay-per-view* technology disclosed the chance of watching all the matches played live.<sup>17</sup> Today, Italians equipped with a satellite dish and a subscription for a TV sports contract with SKY, can watch all the matches of all teams played in the Italian championship. This opportunity is extended to Italians equipped with a digital terrestrial decoder and a TV subscription with two digital channels (MEDIASET PREMIUM and DHALIA TV) although the coverage is partial since each of the two channels has an exclusive with certain teams.

Together with the new opportunities for Italian television users, radical changes involved the financial and organizational position of professional teams and leagues. On this subject the 1996/97 season represents an important turning point in the financial management of Italian football teams; for the first time the revenues from TV rights (€204 million) overpass the revenues from gate attendance (€176 million). Briefly, the whole annual television entrances of the first two Italian professional football Leagues, *Serie A* and *Serie B*, moved from a value of about €50 million in the 1992/93 season to €735 in the 2007/08season.<sup>18</sup> Facing this enormous flow of resources the Italian football system has not been able to generate profits of the same size.<sup>19</sup> Teams reaction to these opportunities were to distribute the major part (often over) of the new resources in acquiring new talents and increasing exponential salaries to the old and new players, neglecting old traditional entrances (gate receipts) and new ones (merchandising). According to the first point, in 2002 the percentage of salaries and wages paid by teams reached 90% of the teams' total revenues leading to a League deficit of about €240 million. Regarding the second point, as stressed by Venturelli (2009), in 2006 the TV entrances of the Italian teams accounted for about 64% of the total revenues, a share undoubtedly higher in respects to the one experienced by other European teams, while the traditional gate revenues reduced to a value of about 13%. This issue involved particularly the top teams; according to the Deloitte (2010) investigations on financial performances of the top 20 European teams the share of broadcasting revenues in 2008 was 58.25% for the top 4 Italian teams versus 38.75% of the other non Italian top teams. The distance was undoubtedly amplified by the transition from a centralized regime of

---

<sup>17</sup> At first, in order to protect gate attendance from TV competition, some restrictions were introduced as black-out in the province where the matches were played, but this rule was soon eliminated.

<sup>18</sup> At constant prices (2007) the ratio between the two values is about 1 to 10.

<sup>19</sup> This assertion could be easily shrunk invoking the *utility oriented* attitude of Italian teams in respects to the *profit oriented* one [Sloane (1971)]. On the other hand the private amusement of several Italian owners could benefit from some State aid thanks to the law 21 February 2003 n.27, known as *decreto spalmadebiti*, that introduced accounting and financial concessions to the professional teams lying heavily on Italian taxpayers.

encrypted TV rights to the subjective rights imposed by the Law 29 March 1999 n.78 composing a series of declarations of the Italian Antitrust Authority (AGCM).<sup>20</sup> The decentralized regime of encrypted TV rights starting from 1999 generated a strong unbalance in the resources collected by Italian teams playing in *Serie A* in favour of big teams generating a *first to last ratio* of about 9 to 1 in 2002. The medium and little teams complaints and a new political approach yielded a legislative intervention ratified by Law 9 January 2008 n.9 reintroducing the collective bargaining starting from the next season (2010/11) in the hopes of a more balanced distribution of TV resources among all the teams, however nothing is explicitly indicated regards television coverage of football events. On this point, the conflict between top and medium-little teams are put forward again. On one hand, teams such as Juventus, Inter and Milan claiming a prominent role in organizational and resource distributional sphere believe that the commercial value of the whole League depends almost exclusively on themselves. On the other hand, the medium and little teams approach these questions highlighting the *joint nature* of the league's production and hence invoking a more equal resource distribution and democratic participation to the league's assessment. At this time this conflict generates a first radical change at an organizational level, leading to controversies, with the split of the first two professional football divisions *Serie A* and *Serie B* in two separate Leagues.

Our goal is to support on the empirical ground the arguments of the teams testing the hypothesis that TV audience is fascinated by uncertain contexts and then more balanced competition, independently by the presence of the top teams or, on the contrary, if the TV audience is only interested in the top team performances. Roughly speaking, how does the competitive balance and hence more (*ex-ante*) uncertain matches influence the TV audience in Italy?

#### **4. Television Audience in Italy: an empirical investigation**

In this section we aim at investigating the preference structure of the *couch potato* audience; particularly we will try to establish which are the variables influencing the television audience of the first Italian championship. Our goal is to capture similarities or differences of the Italian preferences in respects to those emerged in other studies concerning other European realities. This in order to support or oppose Italian top teams' arguments about their decisive

---

<sup>20</sup> See measure 1<sup>st</sup> July 1999 n.7340 - I362 of AGCM relative to TV rights bargaining.

role in determining the success and hence the commercial appeal of TV programming apart from competitive balance effects.

The empirical investigation is based on the matches played in *Serie A* during the 2008/09 season, from August 2008 till May 2009. Data on TV audience refers to the satellite channel SKY and are officially provided and published by the LNP (Lega Nazionale Professionisti) on its website. The choice of evaluating the TV audience by the use of satellite television data depends on several points. First, in respects to other European tournaments where only a restricted number of matches are televised live, the coverage of the matches played in *Serie A* is all-inclusive, although conditioned by the SKY “package” purchased. The SKY platform had a total coverage of the 380 matches of the championship which was not granted by other platforms. In fact the other two digital channels’ owners of encrypted TV rights, MEDIASET PREMIUM and LA7 in the 2007/08 season, had only a partial coverage of matches according to the subscription terms agreement with a limited number of teams. The people subscribing to the SKY CALCIO package acquired the right of watching all matches live on their satellite channel. It must be differentiated by the other SKY SPORT package that gave only the opportunity of watching live advanced (on Saturday evening and night) or postponed (on Sunday night) matches and one or two matches of the traditional fixed time on Sunday evening. Data provided by LNP include the cumulative share registered by SKY pointing out by a star those matches televised on plus channels (SKY CALCIO and SKY SPORT).

The second rationale for choosing satellite television audience in our estimation depends on the fact that the fans’ decision is not based on price evaluation. Each subscriber of the SKY CALCIO or SKY SPORT package paid a fixed amount (usually per monthly for a period of one year) so that the marginal cost of watching a single match is null. This is not (always) true for digital television platforms since together with the opportunity of subscribing to an all-inclusive package (for selected teams) it is possible to acquire the right for a single match deducting a certain amount (in the season under investigation for about €7) from a *pay-as-you-go* card.

The third point, in favour of satellite television audience estimation, is the promptness and regularity of data provision regarding the audience of SKY that is checked by the official institute that monitors all Italian TV programming (AUDITEL), meanwhile, data on digital television audience are not available. The satellite television audience registered by SKY is provided by LNP in the form of absolute spectator number of and the share. In our econometric estimation we selected the share (*SHARE*) rather than the absolute number of

spectators in order to take into account the possibility of a growing number of subscribers during the tournament.

Partially following the indications of the previous literature, and including some specifics of Italian scenery, we tried to identify those variables influencing the audience of Italian *couch potatoes*. We introduced both sports and programming topics. For example, as specified previously, 3 of the 10 matches in each round are played in advance or are postponed in respects to the (ex) Italian traditional date on Sunday evening.<sup>21</sup> Two matches are played on Saturday evening and on Saturday night, usually by teams engaged with the Champions League tournament in the succeeding Tuesday; one match, chosen by the management of SKY, is postponed on Sunday night. Our opinion is that the TV programming collocation must be not neglected in order to evaluate its appeal on the share since the matches played in advance or postponed do not have perfect substitutes. This feature is captured by introducing three dummies  $D_{STE}$ ,  $D_{STN}$  and  $D_{SNN}$  respectively for matches played on Saturday evening, Saturday night and Sunday night. These dummies ought to capture the positive effect on SHARE induced by the absence of contemporary matches. The dummy  $D_{SNN}$  would also catch the positive gap on SHARE since the matches played on Sunday night are selected on the basis of their great potential appeal on TV audience. Another dummy variable needs to be introduced in order to take into account the opportunity of several matches to be watched by different audiences. As specified above the matches played in advance and postponed can be watched on TV both by that subscribers of SKY CALCIO and SKY SPORT packages, while the matches on Sunday evening can be watched on TV only by the formers. However, subscribers of the SKY SPORT package also have the opportunity of watching one or two matches played on Sunday evening, selected randomly by SKY, increasing the potential audience of the match. With dummy variable  $D_{PLUS}$  we indicated the matches transmitted on both platforms trying to isolate the positive effect of reaching a more inclusive audience.

A third thought about the TV programming refers to the days of the matches. It is not rare that, given the intensive sporting calendar upon which the teams are subject to close the championship within the middle of May, some rounds are played in the middle of the week or on other working days. It is our opinion that this collocation could influence the audience and this suggested the introduction of a dummy variable ( $D_{WDAY}$ ) in order to isolate the presumed negative effect of the middle week collocation.

---

<sup>21</sup> In the 2007/08 season only the matches of the last two rounds have been played at the same time in order to avoid potential fraud.

Other variables have a typical sports character. The first refers to the (expected) quality of the match. Following the approach of Hall, Szymanski and Zimbalist (2002), Forrest, Simmons and Buraimo (2005) and Buraimo and Simmons (2008) for the British context, and Szymanski (2004) for the Italian environment, we introduced the athletes payroll of each single team as a proxy for talent and hence the teams/matches' quality. This is because of the strong correlation that emerged in the previous empirical contributions between paid salaries and teams' sport performances. Note that the information about players' wages is really poor since only public traded teams are forced in its widespread. The only way to collect homogeneous data on each single team's payroll is to turn to a journalistic source.<sup>22</sup> We then introduced, as an independent variable capturing the quality of each single match played, the combined wages indicated as  $CWG_i$ , where  $i$  refers to the  $i$ -th match played.<sup>23</sup> The  $CWG_i$  variable was derived as follows:

$$CWG_i = RWG_{Hi} \cdot RWG_{Ai}, \quad (1)$$

where  $RWG_{Hi}$  and  $RWG_{Ai}$  indicates the relative amount of net wages, respectively of home team and away team, engaged in the  $i$ -th match, and relative values are obtained as

$$RWG = \frac{WG}{AWG}, \quad (2)$$

where  $WG$  is the value of total (net) wages paid by the single team and  $AWG$  the average net payroll of the teams participant to the League in the season under investigation. This specification adheres to that used by Forrest, Simmons and Buraimo (2005) and summarizes the quality of talent available for each single match.

A fourth variable introduced in the regression equation is associated to match uncertainty. As in the seminal papers of Pope and Thomas (1989) and Peel and Thomas (1992) until the recent studies cited previously, we extracted information about the closeness of the game using betting data associated to each single match. The betting odds have been collected from newspapers using data of a single bookmaker agency since there is not substantial distance among odds fixed by different agencies. On the opportunity and lacks of using betting odds as a proxy for measuring match uncertainty we refer to the contribution of Forrest and Simmons (2002). We used two variables as a proxy for the closeness of the game; the first is the absolute value of winning probability difference ( $APD$ ) between home and away teams. This selection needs an explanation. As well known the odds associated to each

---

<sup>22</sup> This is the case of Montanari and Silvestri (2007).

<sup>23</sup> Data on team payrolls are obtained from La Gazzetta dello Sport, September 2008. Special thank to Federico Valdambri of the U.S. Sampdoria for his precious collaboration in data collection.

single football match appear as a fixed multiplying factor of the sum paid to the better for each correct result. Then, to derive the probabilities associated to each result we ought to take into account the mark-up of the betting agencies. To clarify, if we select an event (or match)  $i$  and associate three possible results  $j$  (with  $j=1, X, 2$ , indicating respectively home win, draw and away win) with fixed odds equal to  $q_{i,j}$ , the variable  $APD_i$  is given by

$$APD_i = |P_{i1} - P_{i2}|, \quad (3)$$

where

$$P_{i1} = \frac{1/q_{i1}}{S}, \quad P_{i2} = \frac{1/q_{i2}}{S}, \quad \text{and} \quad S = \sum_j \frac{1}{q_{ij}}. \quad (4)$$

It is obvious that an increase in  $APD$  indicates a reduction in uncertainty so that the expected sign in the relationship with TV audience is negative.

The second way in which the closeness of the match is introduced refers to the *Theil index* used for the first time in this context by Peel and Thomas (1992) and adopted by Czarnitzki and Stadtmann (2002) in order to study the impact of uncertainty on gate attendance in the *Bundesliga*. This measure takes into account not only the probability of winning but the heterogeneity of the probabilities associated to the three results, including the draw. The *Theil index* or *Theil Measure (TM)* is obtained as

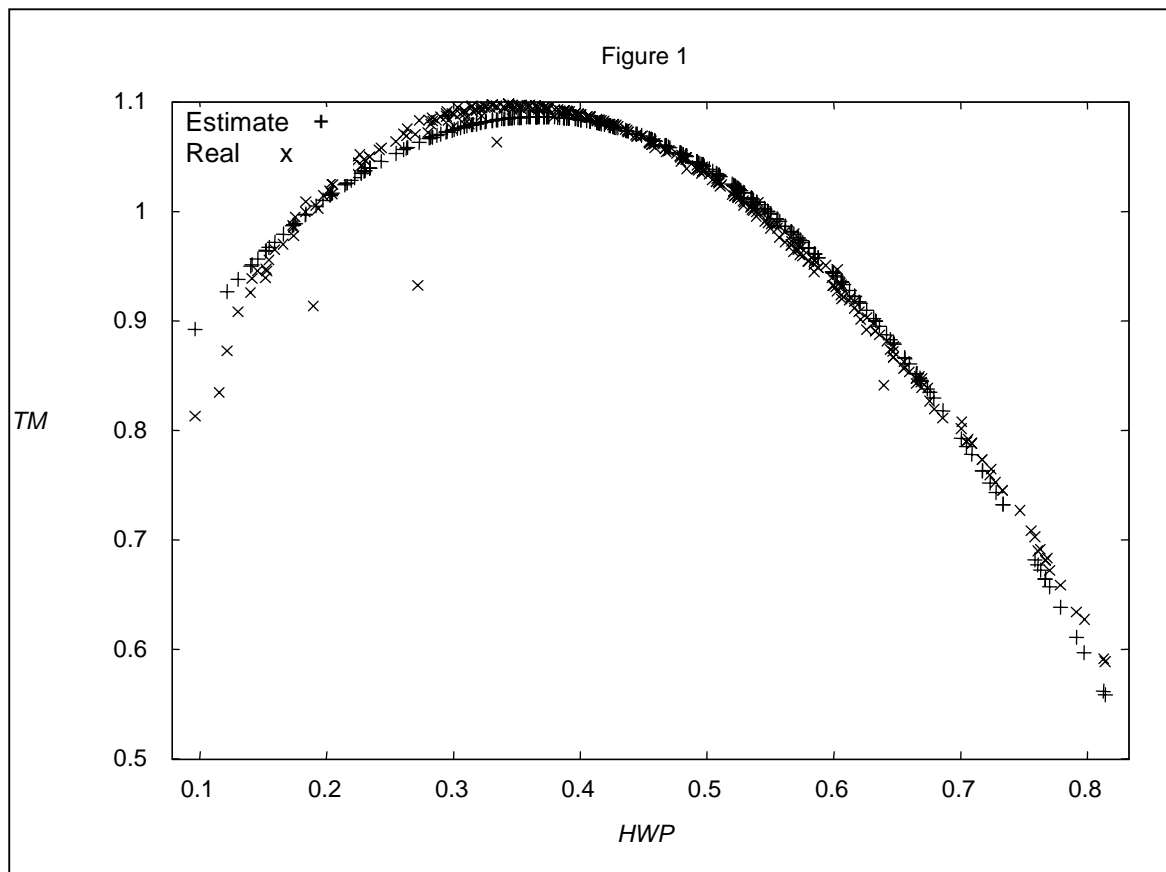
$$TM_i = \sum_j \left[ \ln \left( \frac{1}{P_{ij}} \right) \cdot P_{ij} \right], \quad (5)$$

where  $P_{ij}$  is the probability associated to the  $j$ -th result of the  $i$ -th match. The index lies between zero, for matches with absolute clear results (not included in our sample), and  $\ln 3 \approx 1,0986$ , for matches with an equal probabilities distribution among results. The expected sign in the regression is obviously positive.

A deeper analysis on variables associated to the closeness of the games suggests that a specified relationship appears between  $TM$  and the home team win probability ( $HWP$ ). In particular the *Theil Measure* is almost a perfect quadratic approximation of  $HWP$  as confirmed by the following OLS estimated equation on the whole sample of 380 observations:

$$TM = 0.73 + 1.94 \cdot HWP - 2.64 \cdot (HWP)^2, \quad (6)$$

with an  $\bar{R}^2 = 0.982$ . The relationship is depicted in figure 1.



It confirms that *Theil Measure* is a good approximation of the home team win probability and then, the former variables, could be used as a proxy in the estimate of the relationship between match uncertainty and TV audience. To complete the uncertainty scheme we also introduced the probabilities associated to the away team win (*AWP*) and draw (*DP*).

Together with the uncertainty effect we tried to isolate the possible superstar effect on TV audience. As suggested by Dobson and Goddard (2001, p 424) “*Inevitably the television coverage was skewed in favour of the clubs with the most followers, bringing the exploits and achievements of their leading players*”. According to this position we want to test the attitude of TV spectators to prefer matches involving players with extraordinary skill. Using the ranking drawn up by *France Football* in order to assign the annual prize to the best football player,<sup>24</sup> we introduced a dummy variable (*D\_STAR*) by which we identified the matches involving the players classified, at least once in their career, in the first three positions of this special award.<sup>25</sup> The expected sign in the regression is positive.

<sup>24</sup> Until 1995 the “Golden Ball” award was an exclusive for European football players. From 1995 to 2007 the prize was extended to players from all of the world if they played in a European team end successively. From 2007 it was extended to all players without limitations [see *Almanacco Illustrato del Calcio* (2010)].

<sup>25</sup> In the 2008/09 season the players involved were Beckham (Milan), Buffon (Juventus), Figo (Inter), Kaká (Milan), Maldini (Milan), Nedved (Juventus), Ronaldinho (Milan) and Shevchenko (Milan). Note that the dummy equals 1 if at least one of the formers played the match from the first minute.



Another variable introduced in our estimation refers to the specific attitude of certain matches. As suggested and estimated by other authors some matches generates a greater appeal because of geographical reasons; this is the case of matches played by team located in the same region or in the same city. For this reason we introduced a dummy variable named *D\_DERBY* in order to capture their positive effects on TV audience.

Again we introduced in our estimation a variable taking into account the number of supporters of each single team involved in the match. We used as a proxy the data collected from the opinion poll carried out by the Nielsen Group between June and August 2008 and of which results were published in December of the same year.<sup>26</sup> The data refers both to the number of supporters of the home team [home team fans (*HTF*)] and away team [away team fans (*ATF*)]; in our estimation we used the relative number of fans, *RHF* and *RAF* respectively, in the form of the share between the absolute number of fans (*FANS*) for each team and the championship average.

To finish we introduced a dummy variable, named *D\_TOP3*, associated to the matches in which were involved the first three teams for number of titles won and number of supporters (Juventus, Milan and Inter). This variable aims at capturing specific attitudes of those teams in order to generate oversized TV audience, net of the effects of other variables. The three teams are the ones that first negotiated the pay-per-view TV rights individually invoking, as specified in previous section, their crucial role in determining the TV audience selection of championship events. Table 1 resumes data features.

TABLE 1: DESCRIPTIVE STATISTICS (380 OBS.)

<i>Variable</i>	<i>Description</i>	<i>Mean</i>	<i>Min</i>	<i>Max</i>	<i>Middle</i>	<i>SD</i>
<i>SHARE</i>	<i>TV audience in pct.</i>	1,8672	0,0100	9,9700	0,8700	2,0979
<i>CWG</i>	<i>Combined Wages</i>	0,9551	0,0965	9,7555	0,4446	1,4032
<i>APD</i>	<i>Absolute value of difference in winning probabilities</i>	0,2871	0,000	0,7638	0,2779	0,1937
<i>HWP</i>	<i>Home team win probability</i>	0,4546	0,0964	0,8142	0,4519	0,1582
<i>AWP</i>	<i>Away team win probability</i>	0,2701	0,0507	0,6883	0,2458	0,1373

<sup>26</sup> See Repubblica.it dated 15 December 2008

<i>DP</i>	<i>Draw probability</i>	0,2753	0,1351	0,5943	0,2854	0,0416
<i>TM</i>	<i>Theil Measure</i>	1,0005	0,5889	1,0983	1,0388	0,1094
<i>FANS</i>	<i>Number of fans of each single team</i>	1,8924*10 <sup>6</sup>	4.800	1,0040*10 <sup>7</sup>	9,5050*10 <sup>5</sup>	2,5189*10 <sup>6</sup>

## 5. Estimation results

We estimated several equations using OLS regressions with correction for heteroschedasticity distinguishing our estimates first on the basis of the sample size. Initially we concentrate on the sample of 191 observations including the matches played contemporarily on Sunday evening and excluding those broadcasted by SKY on both channels CALCIO and SPORT. Later we extended the sample size to 279 observations adding data from matches played on Sunday evening that were broadcasted on both channels and excluding only the data from matches played in advance or postponed; finally we included in the estimates all 380 observations. The results of the three estimations are summarized respectively in columns 1 of tables 2, 3 and 4. For each of the three samples a second distinction has been made on the basis of independent variable selections. First we introduced the independent variables omitting those referring to the closeness of the match. In a second step we expanded the set of independent variables to those capturing, in our opinion, the match uncertainty in order to isolate its relevance on the TV audience variability. The results are reported in columns 2-6 of tables 2, 3 and 4.

**Table 2 - OLS Estimate of TV audience of Italian Serie A 2008/09**

Dependent Variable: <i>SHARE</i> (191 obs)						
	1	2	3	4	5	6
<i>Constant</i>	0,042 (0,034)	<b>0,095**</b> (0,044)	-0,516 (0,352)	-0,200 (0,339)	<b>-0,283*</b> (0,143)	-0,166 (0,210)
<i>CWG</i>	-0,059 (0,144)	-0,053 (0,143)	-0,055 (0,143)	-0,055 (0,124)	-0,062 (0,144)	-0,051 (0,145)
<i>D_WDAY</i>	<b>-0,320***</b> (0,073)	<b>-0,326***</b> (0,074)	<b>-0,319***</b> (0,073)	<b>-0,315***</b> (0,085)	<b>-0,315***</b> (0,073)	<b>-0,321***</b> (0,073)
<i>RHTF</i>	<b>0,523***</b> (0,073)	<b>0,557***</b> (0,066)	<b>0,559***</b> (0,066)	<b>0,542***</b> (0,065)	<b>0,547***</b> (0,066)	<b>0,541***</b> (0,065)
<i>RATF</i>	<b>0,524***</b> (0,069)	<b>0,517***</b> (0,067)	<b>0,514***</b> (0,068)	<b>0,526***</b> (0,058)	<b>0,549***</b> (0,074)	<b>0,522***</b> (0,069)
<i>D_TOP3</i>	<b>-0,685**</b> (0,295)	<b>-0,643**</b> (0,297)	<b>-0,610*</b> (0,310)	<b>-0,616**</b> (0,257)	<b>-0,604*</b> (0,321)	<b>-0,662**</b> (0,303)
<i>D_STAR</i>	<b>0,703**</b> (0,300)	<b>0,686**</b> (0,300)	<b>0,661**</b> (0,314)	<b>0,676***</b> (0,237)	<b>0,715**</b> (0,323)	<b>0,683**</b> (0,307)
<i>APD</i>		<b>-0,276*</b>				

		(0,165)		0,530 (0,329)		
<i>TM</i>						
<i>HWP</i>					1,184 (1,406)	
<i>HWP_SQ</i>					-1,394 (1,484)	
<i>AWP</i>						2,335** (0,939)
<i>AWP_SQ</i>						-3,903** (1,626)
<i>DP</i>						0,692 (0,681)
$\bar{R}^2$	0,641	0,644	0,643	0,639	0,648	0,641
St. err. of res.	0,355	0,354	0,354	0,356	0,352	0,355
F Stat.	43,15***	40,09***	39,00***	43,13***	36,51***	37,53***
Log likelihood	-69,71	-68,49	-68,70	-69,18	-66,92	-69,27
AIC	153,43	152,97	153,41	156,37	151,84	154,55
BIC	176,20	178,99	179,43	185,64	181,11	165,09
HQC	162,65	163,51	163,95	168,22	163,69	165,87
RESET Test	4,77***	4,61***	3,99***	4,07***	3,61***	4,39**
WHITE Test	45,71***	55,58***	55,60***	61,39***	61,74***	53,17***
NORM Test	40,05***	40,37***	42,69***	42,97***	40,93***	41,73***
Notes: Standard Errors (robusts for heteroscedasticity) in parentheses. <i>Statistical Significance</i> : ***>99%, **>95%, *>90%.						

Table 3 - OLS Estimate of TV *audience* of Italian *Serie A* 2008/09

Dependent Variable: <i>SHARE</i> (279 obs)						
	1	2	3	4	5	6
<i>Constant</i>	0,062 (0,049)	<b>0,149***</b> (0,054)	-0,608 (0,384)	-0,369 (0,364)	<b>-0,285*</b> (0,168)	-0,231 (0,236)
<i>CWG</i>	<b>0,358***</b> (0,085)	<b>0,344***</b> (0,081)	<b>0,340***</b> (0,083)	<b>0,337***</b> (0,085)	<b>0,329***</b> (0,082)	<b>0,352***</b> (0,084)
<i>PLUS</i>	<b>0,292***</b> (0,057)	<b>0,291***</b> (0,058)	<b>0,290***</b> (0,057)	<b>0,288***</b> (0,058)	<b>0,285***</b> (0,058)	<b>0,292***</b> (0,057)
<i>D_WDAY</i>	<b>-0,455***</b> (0,067)	<b>-0,461***</b> (0,069)	<b>-0,456***</b> (0,068)	<b>-0,449***</b> (0,068)	<b>-0,460***</b> (0,071)	<b>-0,459***</b> (0,270)
<i>D_DERBY</i>	0,228 (0,405)	0,219 (0,396)	0,213 (0,401)	0,219 (0,407)	0,227 (0,402)	0,213 (0,407)
<i>RHTF</i>	<b>0,395***</b> (0,057)	<b>0,422***</b> (0,061)	<b>0,426***</b> (0,063)	<b>0,411***</b> (0,066)	<b>0,408***</b> (0,064)	<b>0,413***</b> (0,061)
<i>RATF</i>	<b>0,347***</b> (0,052)	<b>0,338***</b> (0,052)	<b>0,336***</b> (0,051)	<b>0,358***</b> (0,054)	<b>0,377***</b> (0,056)	<b>0,343***</b> (0,052)
<i>D_TOP3</i>	-0,099 (0,217)	-0,021 (0,211)	-0,007 (0,218)	0,017 (0,244)	0,038 (0,226)	-0,061 (0,218)
<i>D_STAR</i>	-0,283 (0,184)	-0,293 (0,184)	-0,300 (0,185)	-0,304 (0,187)	-0,282 (0,182)	-0,290 (0,184)
<i>DAPV</i>		<b>-0,368**</b> (0,179)				
<i>TM</i>			<b>0,651*</b> (0,357)			
<i>HWP</i>				2,051 (1,521)		
<i>HWP_SQ</i>				-2,293 (1,565)		
<i>AWP</i>					<b>2,659**</b> (1,011)	
<i>AWP_SQ</i>					<b>-4,532***</b> (1,664)	
<i>DP</i>						1,013 (0,771)
$\bar{R}^2$	0,723	0,727	0,726	0,724	0,730	0,724
St. err. of res.	0,436	0,433	0,434	0,435	0,431	0,435
F Stat.	46,23***	43,59***	43,31***	40,16***	42,98***	42,25***
Log likelihood	-159,57	-157,34	-157,84	-158,07	-155,45	-158,07
AIC	337,14	334,68	335,67	338,14	332,90	337,41
BIC	369,82	370,99	371,98	378,08	372,84	373,72
HQC	350,25	349,24	350,24	354,16	348,92	351,97
RESET Test	3,22**	3,43**	3,00*	2,46*	2,74*	3,13**
WHITE Test	185,03***	185,60***	187,13***	194,52***	195,85***	187,77***
NORM Test	52,69***	50,40***	52,03***	52,61***	51,50***	52,76***

Notes: Standard Errors (robusts for heteroscedasticity) in parentheses. *Statistical Significance*: \*\*\*>99%, \*\*>95%, \*>90%.

Table 4 - OLS Estimate of TV audience of Italian Serie A 2008/09

Dependent Variable: <i>SHARE</i> (380 obs)						
	1	2	3	4	5	6
<i>Constant</i>	0,053 (0,046)	<b>0,176***</b> (0,064)	<b>-0,847**</b> (0,373)	<b>-0,715*</b> (0,389)	<b>-0,355**</b> (0,158)	<b>-0,454*</b> (0,258)
<i>CWG</i>	<b>0,375***</b> (0,043)	<b>0,357***</b> (0,042)	<b>0,357***</b> (0,042)	<b>0,349***</b> (0,043)	<b>0,339***</b> (0,042)	<b>0,364***</b> (0,043)
<i>PLUS</i>	<b>0,225***</b> (0,070)	<b>0,230***</b> (0,070)	<b>0,228***</b> (0,070)	<b>0,223***</b> (0,070)	<b>0,222***</b> (0,069)	<b>0,232***</b> (0,069)
<i>D_STE</i>	<b>2,231***</b> (0,167)	<b>2,227***</b> (0,166)	<b>2,228***</b> (0,166)	<b>2,241***</b> (0,167)	<b>2,254***</b> (0,166)	<b>2,230***</b> (0,165)
<i>D_STN</i>	<b>2,316***</b> (0,156)	<b>2,297***</b> (0,158)	<b>2,299***</b> (0,158)	<b>2,306***</b> (0,158)	<b>2,293***</b> (0,157)	<b>2,300***</b> (0,157)
<i>D_SNN</i>	<b>2,907***</b> (0,202)	<b>2,872***</b> (0,201)	<b>2,867***</b> (0,199)	<b>2,878***</b> (0,198)	<b>2,878***</b> (0,195)	<b>2,880***</b> (0,200)
<i>D_WDAY</i>	<b>-0,609***</b> (0,100)	<b>-0,621***</b> (0,100)	<b>-0,615***</b> (0,100)	<b>-0,597***</b> (0,100)	<b>-0,610***</b> (0,099)	<b>-0,615***</b> (0,098)
<i>D_DERBY</i>	0,333 (0,240)	0,309 (0,237)	0,310 (0,240)	0,327 (0,243)	0,319 (0,238)	0,309 (0,242)
<i>RHTF</i>	<b>0,336***</b> (0,054)	<b>0,360***</b> (0,055)	<b>0,363***</b> (0,055)	<b>0,327***</b> (0,060)	<b>0,326***</b> (0,059)	<b>0,356***</b> (0,059)
<i>RATF</i>	<b>0,379***</b> (0,059)	<b>0,359***</b> (0,058)	<b>0,354***</b> (0,058)	<b>0,392***</b> (0,065)	<b>0,397***</b> (0,063)	<b>0,365***</b> (0,059)
<i>D_TOP3</i>	0,149 (0,210)	0,281 (0,217)	0,299 (0,224)	0,382 (0,245)	<b>0,426*</b> (0,236)	0,240 (0,219)
<i>D_STAR</i>	-0,113 (0,191)	-0,140 (0,190)	-0,146 (0,191)	-0,165 (0,190)	-0,165 (0,188)	-0,132 (0,190)
<i>DAPV</i>		<b>-0,477**</b> (0,196)				
<i>TM</i>			<b>0,884**</b> (0,359)			
<i>HWP</i>				<b>3,475**</b> (1,573)		
<i>HWP_SQ</i>				<b>-3,645**</b> (1,560)		
<i>AWP</i>					<b>3,400***</b> (1,035)	
<i>AWP_SQ</i>					<b>-5,968***</b> (1,735)	
<i>DP</i>						<b>1,784**</b> (0,890)
$\bar{R}^2$	0,919	0,920	0,920	0,920	0,922	0,920
St. err. of res.	0,596	0,593	0,593	0,592	0,587	0,594
F Stat.	328,15***	320,44***	317,33***	301,77***	308,66***	306,73***
Log likelihood	-336,64	-333,90	-334,00	-333,13	-329,47	-334,76
AIC	697,29	693,81	694,01	694,27	686,94	695,51
BIC	744,57	745,03	745,22	749,43	742,10	746,73
HQC	716,05	714,13	714,33	716,16	708,83	715,84
RESET Test	18,59***	17,87***	17,02***	15,49***	14,90***	17,45***
WHITE Test	190,05***	214,84***	214,83***	226,40***	229,53***	210,52***
NORM Test	61,29***	58,80***	59,63***	57,81***	56,99***	60,36***

Notes: Standard Errors (robusts for etheroschedasticity) in parentheses. *Statistical Significance*: \*\*\*>99%, \*\*>95%, \*>90%.

The results, net of uncertainty effects (described in columns 1), show some singularities associated to the different sample sizes. First, the different attitude in achieving the variability of the TV audience; as we can see  $\bar{R}^2$  is lower for the estimation on 191 observations in respects to the larger ones. The  $\bar{R}^2$  rises with the number of the observations until a value of about 0.92 in the estimation on 380 observations, but also with the heterogeneity of the audience. Second, particular is the result relative to the significance of the expected quality of the game on the TV audience. In the estimates on the 279 and 380 observations *CWG* is statistically significant, of the expected sign (positive) even without, *ceteris paribus*, a strong impact on the *couch potato* attitude.<sup>27</sup> In the estimate on the 191 observations the same independent variable is statistically not significant and is of the opposite expected sign. The rationale for these results could be explained by the *committed* nature of the SKY CALCIO package subscribers. Among them we find *hard core* fans that follow their favourite team in spite of match quality. This hypothesis is confirmed by the relevance of variables *RHTF* and *RATF* in the estimate for the sample of 191 observations. Here both coefficients of regression are statistically significant and have an expected positive sign and a stronger impact effect on *SHARE* in respects to the one found in the estimates with larger samples. Another interesting difference among estimates regarding different sample sizes refers to the dummies *D\_TOP3* and *D\_STAR*. In the estimate on the smallest sample both coefficients of regression are statistically significant but of the opposite sign, respectively negative the first and positive the second, and almost of the same magnitude. Since the *superstars* involved in the 2008/09 season were players from the three top teams cited, then we are able to conclude that rise in audience, due to the superstar effect, is crowded out by a sort of “top team aversion” of the committed televised audience. This is confirmed by the absence of this phenomenon in the estimates on the largest samples where the results do not replicate both in terms of significance and in the signs of coefficients. In the end, the estimate confirms the importance of the date collocation of matches; the *SHARE* on matches played during the week is reduced by several decimal points with a loss between, on average, 70,000 and 120,000 TV’s spectators. This is probably due to the counter-programming of the other channels, surely more articulated in respects to the weekend. To confirm the role played by TV programming, note that when matches are played alone they guarantee a minimum share of more than 2 points that rises almost to 3 if the match is played during the weekend.

---

<sup>27</sup> In our estimates a match of average quality (i.e. *CWG*=1) impacts the share about 0.35 points, independently on uncertainty associated to the match. This implies very poor results in terms of share when matches involve poor teams in terms of average quality (consider that, as indicated in table 1, the median of *CWG* is 0.445, and presents a below average quality for more than 70 per cent of matches).

The inclusion in the estimates of the variables measuring uncertainty, reported in columns 2-6 of the three tables, generates results not always homogeneous in respects to the sample size. According to the signs of coefficients of the regressions associated to *APD* and *TM* they are of the expected sign even the statistical significance and the impact effects depend on the sample size investigated. According to the first variable the coefficient lies between -0.276 and -0.477, respectively for the samples of 191 and 380 observations. Although its high statistical significance is increasing in the sample size, we can note that its impact effect is not crucial in determining the TV audience. In fact, in order to increase the share by 1 point the *APD* should reduce, *ceteris paribus*, in value in a range between a minimum of 2.1 points (estimate with 191 observations) and a maximum of 3.6 points (estimate with 380 observations). Since by definition the absolute probability difference cannot be over the unity, we can affirm that although the closeness of the match is statistically significant in determining the TV share it does not have a crucial role. A similar speech can be replicated and reinforced for the *TM* variable given the shorter range on which the *Theil mesure* is included. More interesting is the evaluation of the impact respectively of the home and away team win probability. As shown in the perfect squared correlation between *TM* and *HWP*, depicted in figure 1, and as suggested by several empirical investigations on the relationship between home team win probability and gate attendance previously cited, in our estimates both probabilities have been introduced in a quadratic form. First we note that the statistical significance confirms high levels only for the away team probability, while it is inferior for the home team probability with the exception of the 380 observation samples. Those results brought upon the in depth study of the relationship between the share and win probabilities; in particular, while in the previous empirical analysis<sup>28</sup> a quadratic and convex relation emerged (*U-shaped*) between the home team probability and the gate attendance, in our estimate the relationship with the audience is quadratic and concave. If we restrict our discussion to the result summarized in column 4 of table 4, the audience has a peak corresponding to a value of *HWP* about 0.477 and then decreases; considering that in the previous estimated equation (6) between home team win probability and *Theil Measure* the uncertainty increased in the *HWP* up to 0.367 and then decreased. We can affirm that there is a range of *HWP*, lying between 0.367 and 0.477, where match uncertainty decreases while the TV audience increases. This is not a trivial result since the former range included about 23.7% of the *HWP* values (corresponding to 89 observations). The same regards the away

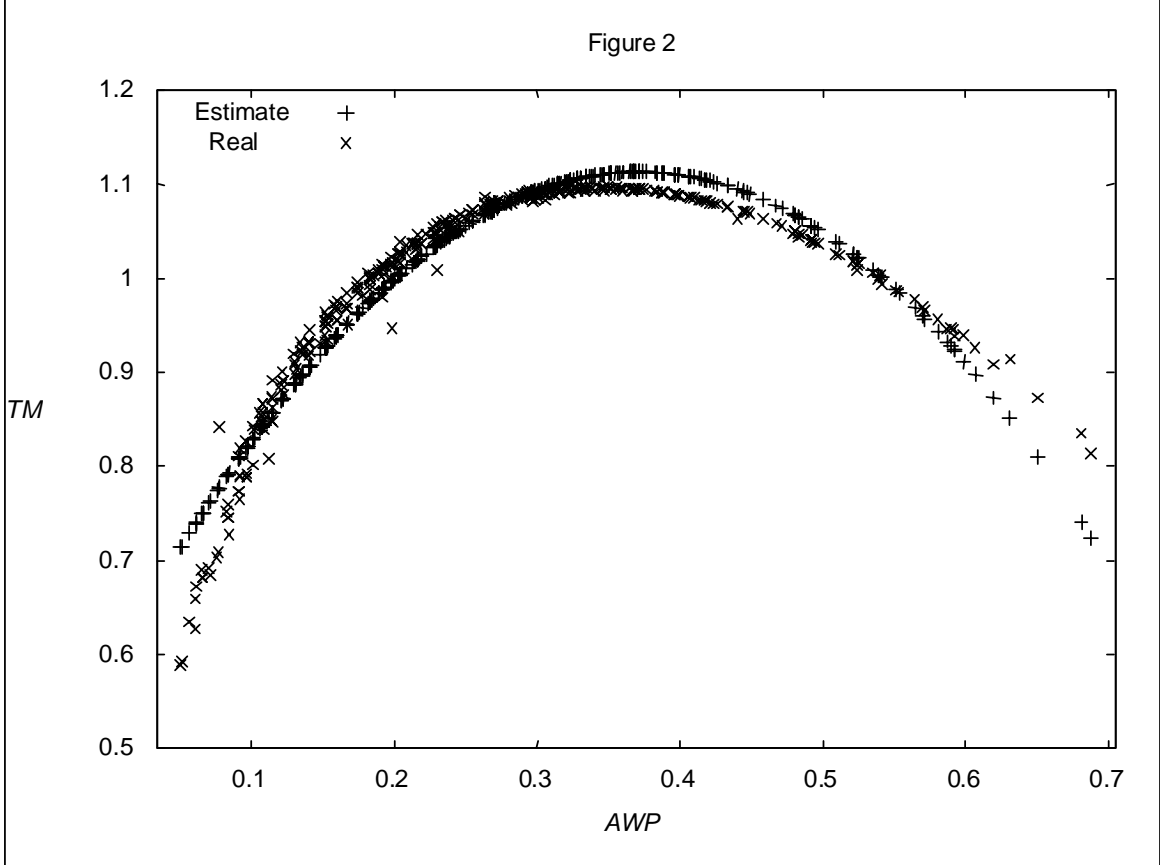
---

<sup>28</sup> See Forrest and Simmons (2002), cit.

team win probability whose relationship with match uncertainty can be approximated by the following equation:

$$TM = 0.58 + 2.89 \cdot AWP - 3.89 \cdot (AWP)^2, \tag{7}$$

with  $\bar{R}^2 = 0.94$  and is depicted in figure 2.



If we consider the coefficients of regression in column 5 of table 4, the TV audience has a peak at an *AWP* value of about 0.285 and then decreases. From equation (7), match uncertainty measured by *TM* is at maximum for the values of *AWP* around 0.371 and then decreases. This means that the away team win probability has a range lying between 0.285 and 0.371 where the uncertainty increases while the *SHARE* decreases involving 75 observations corresponding to about 20% of the sample. The draw probability, introduced in a linear form after appropriate specification tests, shows the expected positive relationship with the TV audience, although highly significant only the estimate on the sample with 380 observations.<sup>29</sup>

<sup>29</sup> A relationship between draw probability and *Theil measure* has been estimated and, as for the other probabilities *HWP* and *AWP*, a quadratic form emerges. This time all the observed values of *DP* are in the increasing section of the arc and then a quadratic specification of the relationship between *DP* and *SHARE* should be redundant, as confirmed by several specification tests.



Last considerations concern the significance of the dummy variable referred to the top teams on TV audience. Previously we tried to explain the connection between  $D\_TOP3$  and the superstar effect that emerged in the estimate on 191 observations. In the other two estimates, together with the variables used as a proxy for the uncertainty, the dummy appears to have low significance and its sign is too sensitive to the equation specification, keeping some coherence only in the estimate with 380 observations with a positive sign. The peaks in the audience registered for matches played by those teams could then be associated to the TV programming factors and to the combined quality of the rosters available since each of the three top teams assessed more than three times the league average.

## 6. Concluding remarks

This paper aims at investigating the main features of a single sports event (football match) able to influence TV audience. We concentrate on Italian *Serie A* focusing on the significance and impact of several independent variables on satellite television share by an econometric investigation of the 380 matches played in *Serie A* during the 2008/09 season. Particular attention has been devoted to variables summarizing the closeness of the game in order to test if theoretical prescriptions of sports economic literature could be confirmed on empirical ground. Using data collected from the official market of sports betting and gathering probabilities associated to the results of each single match we introduced in the OLS regression several explicative variables evaluating the uncertainty of matches under investigation trying to isolate their effect on TV audience. The results confirm that for the Italian championship some peculiarities emerged from other British and Spanish contexts. Even though the distinctions due to the different sample sizes, often capturing different couch potato attitude, it emerges that the inclusion in the estimates of the variables associated to the closeness of the match increase goodness of the fit, but is not crucial in determining the results in terms of TV share. All the coefficients of regression associated to the uncertainty of the match are of the expected sign so that closest context means more TV share, but its intensity is not very strong. Interesting is the relationship between TV share and the probabilities associated to team wins; opposite the previous empirical contributions in which a *U-shaped* relationship emerged between home team win probability and gate attendance with a minimum of about 0.6, in our estimates (particularly on the sample of 380 observations) emerges a quadratic and concave relationship between home team win probability and TV share with a maximum of about 0.48. The same is for the away team win probability whose corresponding maximum value is about 0.28. This implies that an increasing probability of

the home team win is often detrimental for TV share even though uncertainty rises. This situation emerges for about 89 observations of the 380 samples in respects to home team win probability and for about 75 in respects to away team win probability. It is questionable why the audience's peaks are so different in respects to the two probabilities; we could think that, even away team win probability is a good approximation of the *Theil measure*, TV audience does not evaluate the closeness of the game by signals coming from the distribution of the probabilities of the three possible results. On the contrary, when away team win probability lies above some threshold values it is able to cross over the "home field advantage", inducing TV audience to the feelings of less competitive context in respects to the ones indicated by the probability distribution. For confirmation, consider that on average, home team win probability is 18 points higher than away team win probability (see table 1).

At last we can affirm that, although more close contexts are important in determining the interest in sports events and thus on football matches in Italy, they are not decisive. This contrasts the position expressed by the law 9/2008 (Gentiloni-Melandri) that in article 1 it affirms that the new regulation of TV rights must be founded on the grounds of competitive balance in order to preserve the interest (and then the commercial value) of the championship. From our paper and from other studies on the same issues relative to other European countries, we cannot be sure that a more competitive balance environment implies more interest, particularly for the *couch potato* audience. It seems that fans' loyalty processes determined a hardcore base of supporters/audiences aside from competitive contexts implying that the presumed uncommitted nature of the *couch potato* is not confirmed by our empirical investigation. This does not mean that if the commercial value of competitive balance is not high enough we can neglect it and abandon the idea of searching for some way to preserve or improve it, but it is necessary to recognize that competitive balance is a meritorious good that must be protected leaving aside individual preferences. This is confirmed by the social relevance of football that came to light also from the European Parliament Resolution 8 May 2008 based on the White Paper on Sport [COM (2007) 391] and so long debated in literature.<sup>30</sup> If so, independently from the commercial value of the Football Industry, TV rights must not be handled as like other goods in which equilibrium allocation, in terms of price and quantity, is determined by market forces. The resulting competitive balance equilibrium level could reach such a low value that it could jeopardize the entire structure.

---

<sup>30</sup> See Caruso (2008) and Arnaut (2006).



## References

- G. ALLAN, G. ROY, *Does Television Crowd Out Spectators? New Evidence From The Scottish Premiere League*, in *Journal of Sports Economics*, vol. 9, n. 6, 2008, 592-605.
- Almanacco Illustrato del calcio*, Panini, Modena, 2010.
- W. ANDREFF, J.F. BOURG, *Broadcasting Rights and Competition in European Football*, in C. JEANRENAUD, S. KESENNE (eds.), *The Economics of Sport and the Media*, Edward Elgar Publishing, Cheltenham (UK), 2006, 37-65.
- J.L. ARNAUT, *Rapporto Indipendente sullo Sport in Europa*, 2006.
- M. BAIMBRIDGE, S. CAMERON, P.M. DAWSON, *Satellite Television And The Demand For Football: A Whole New Game?*, in *Scottish Journal of Political Economy*, vol. 43, n. 3, 1996, 317-333.
- O. BEHA, A. DI CARO, *Indagine sul calcio*, Biblioteca Universale Rizzoli, Milano 2006.
- T. BOERI, C. BISONI, *Calciopoli anno zero*, in F. BOF, F. MONTANARI, G. SILVESTRI (eds.), *Il Management del Calcio*, Franco Angeli, Milano, 2008, 63-74.
- J. BORLAND, R. MACDONALD, *Demand for Sport*, in *Oxford Review of Economic Policy*, vol. 19, n. 4, 2003, 478-502.
- L. BRANDES, E. FRANCK, *Who Made Who? An Empirical Analysis of Competitive Balance in European Soccer Leagues*, in *Eastern Economic Journal*, vol. 33, n. 3, Summer 2007, 379-402.
- B. BURAIMO, *The Demand for Sport Broadcasting*, in W. ANDREFF, S. SZYMANSKI (eds.), *Handbook on the Economics of Sport*, Edward Elgar, Cheltenham (UK), 2006, 100-111.
- B. BURAIMO, D. FORREST, R. SIMMONS, *Robust estimates of the impact of broadcasting on match attendance in football*, Lancaster University Management School Working Papers, 2006/004, 1-26.
- B. BURAIMO, R. SIMMONS, *A Tale Of Two Audiences: Spectators, Television Viewers And Outcome Uncertainty In Spanish Football*, Lancaster University Management School Working Papers, 2007/43, 1-25.
- B. BURAIMO, R. SIMMONS, *Do Sport Fans Really Value Uncertainty of Outcome? Evidence from the English Premiere League*, in *International Journal of Sport Finance*, vol. 3, n. 3, 2008, 146-155.
- R. CARUSO, *Il Calcio tra Mercato, Relazioni e Coercizione*, in *Rivista di Diritto ed Economia dello Sport*, vol. 4, n. 1, 2008, 71-88.
- D. CZARNITZKI, G. STADTMANN, *Uncertainty of Outcome Versus Reputation: Empirical Evidence for the First German Football Division*, in *Empirical Economics*, vol. 27, n. 1, 2002, 101-112.
- DELOITTE, *Spanish Masters – Football Money League*, March 2010.
- M. DI DOMIZIO, *La Domanda di Calcio in Italia: Serie A 1962-2006*, in *Rivista di Diritto ed Economia dello Sport*, vol. 3, n. 1, 2007, 71-90.
- S. DOBSON, J. GODDARD, *The Economics of Football*, University Press, Cambridge (UK), 2001.
- P. DOWNWARD, A. DAWSON, *The Economics of Professional Football*, Routledge, London, 2000.

- G. DRAGONI, *Conti in rosso per il calcio; Inter e Milan, perdite record*, Il Sole 24ore, 1 maggio 2009.
- M. EL HODIRI, J. QUIRK, *An Economic Model of a Professional Sports League*, in *Journal of Political Economy*, vol. 79, n. 6, 1971, 1302-19.
- J. FIGUS DIAZ, V. FORTI, *La Disciplina Antitrust Della Nuova Legislazione Sui Diritti Di Trasmissione: Quid Novi Sub Sole?*, in *Rivista di Diritto ed Economia dello Sport*, vol. 4, n. 2, 2008, 13-35.
- D. FORREST, R. SIMMONS, *Outcome uncertainty and attendance demand in sport: the case of English soccer*, in *The Statistician*, vol. 51, n. 2, 2002, 229-241.
- D. FORREST, R. SIMMONS, *New Issues In Attendance Demand; The Case Of English Soccer*, in *Journal of Sports Economics*, vol.7, n. 3, 2006, 247-266.
- D. FORREST, R. SIMMONS, B. BURAIMO, *Outcome Uncertainty And The Couch Potato Audience*, in *Scottish Journal of Political Economy*, vol. 52, n. 4, 2005, 641-661.
- D. FORREST, R. SIMMONS, S. SZYMANSKI, *Broadcasting, Attendance And The Inefficiency Of Cartels*, in *Review of Industrial Organization*, vol. 24, n. 3, 2004, 243-265.
- R.D. FORT, *Sports Economics* (2<sup>nd</sup> edition), Pearson Prentice Hall, Upper Saddle River (NJ, USA), 2006.
- J. GARCIA, P. RODRIGUEZ, *The Determinants of Football Match Attendance Revisited: Empirical Evidence From the Spanish Football League*, in *Journal of Sports Economics*, vol. 3, n. 18, 2003, 18-38.
- B. GERRARD, *Competitive Balance and the Sports Media Rights Market: What are the Real Issues?*, in C. JEANRENAUD, S. KESENNE (eds.), *The Economics of Sport and the Media*, Edward Elgar Publishing, Cheltenham (UK), 2006, 26-36.
- M. HAAN, R.H. KONING, A. VAN WITTELOOSTUIJN, *Competitive Balance in National European Soccer Competitions*, in J. ALBERT, R. H. KONING (eds.), *Statistical Thinking in Sports*, Chapman & Hall, Boca Raton (FL, USA), 2008, 63-76.
- S. HALL, S. SZYMANSKI, A. ZIMBALIST, *Testing Causality Between Team Performance and Payroll: The Case of Major League Baseball and English Soccer*, in *Journal of Sports Economics*, vol. 3, n. 2, 2002, 149-168.
- T. HOEN, S. SZYMANSKI, *The Americanization of European Football*, in *Economic Policy*, vol. 28, April, 2001, 205-233.
- C. JEANRENAUD, S. KESENNE, *Sport and the Media: An Overview*, in C. JEANRENAUD, S. KESENNE (eds.), *The Economics of Sport and the Media*, Edward Elgar Publishing, Cheltenham (UK), 2006, 1-25.
- C. JEANRENAUD, S. KESENNE (eds.), *The Economics of Sport and the Media*, Edward Elgar Publishing, Cheltenham (UK), 2006.
- U. LAGO, A. BARONCELLI, S. SZYMANSKI (eds.), *Il Business del Calcio*, Egea, Milano, 2004.
- M. LEEDS, P. VON ALLMEN, *The economics of Sport*, Pearson-Addison Wesley, Boston, 2005.
- F. MONTANARI, G. SILVESTRI, *Le determinanti della retribuzione tra risultati e caratteristiche individuali: il caso del campionato di calcio di Serie A*, in *Rivista di Diritto ed Economia dello Sport*, vol. 3, n. 1, 2007, 91-106.

- W.C. NEALE, *The Peculiar Economics of Professional Sports*, in *Quarterly Journal of Economics*, vol. 78, n. 1, 1964, 1-14.
- M. NICOLIELLO, *Reddito e capitale nelle società di calcio: la massima serie italiana 1998-2007*, in *Rivista di Diritto ed Economia dello Sport*, vol. 4, n. 2, 2008, 67-94.
- R. NOLL, *Broadcasting and Team Sports*, in *Stanford Institute for Economic Policy Research Discussion Paper No. 06-16*, University of Stanford, February 2007.
- D.A. PEEL, D. A. THOMAS, *The demand for football: Some evidence on outcome uncertainty*, in *Empirical Economics*, vol. 17, n. 2, 1992, 323-331.
- S. PERLASCA, *Collective Selling of Broadcast Rights in Team Sports*, in W. ANDREFF, S. SZYMANSKI (eds.), *Handbook on the Economics of Sport*, Edward Elgar, Cheltenham (UK), 2006, 719-729.
- P.F. POPE, D.A. THOMAS, *Information, prices and efficiency in a fixed-odds betting market*, in *Economics*, vol. 56, n. 223, 1989, 323-341.
- RISOLUZIONE DEL PARLAMENTO EUROPEO DELL'8 MAGGIO 2008 SUL LIBRO BIANCO SULLO SPORT [2007/2661 (INI)], in *Rivista di Diritto ed Economia dello Sport*, vol. 4, n. 2, 2008, 123-151.
- R. SANDY, P. SLOANE, M.S. ROSENTRUB, *The Economics of Sport – An International Perspective*, Palgrave Macmillan, New York, 2004.
- S.K.S. DE SANTANA, A.S. DA SILVA, *The Determinants of Demand in Football Matches During the 2007 Brazilian Championship*, IASA/NAASE Working Paper Series, No. 09-06, June 2009.
- P.J. SLOANE, *The Economics of Professional Football: The Football Club as a Utility Maximiser*, in *Scottish Journal of Political Economy*, vol. 18, n. 2, 1971, 121-146.
- S. SZYMANSKI, *Income Inequality, Competitive Balance and the Attractiveness of Team Sports: Some Evidence and a Natural Experiment from English Soccer*, in *The Economic Journal*, vol. 111, n. 469, 2001, F69-F84.
- S. SZYMANSKI, *Economic Design of Sporting Contest*, in *Journal of Economic Literature*, vol. 41, n. 4, 2003, 1137-1187.
- S. SZYMANSKI, *La relazione tra posizione competitiva e posizione reddituale: quali sono le squadre migliori?*, in U. LAGO, A. BARONCELLI, S. SZYMANSKI (eds.) *Il Business del Calcio*, Franco Angeli, Milano, 2004, 149-166.
- R. TAVELLA, *Il libro nero del calcio italiano*, Newton & Compton, Roma, 2006.
- A. TONAZZI, *Competition Policy and the Commercialization of Sport Broadcasting Rights*, in *International Journal of the Economics of Business*, vol. 10, n. 1, 2003, 17-34.
- V. VENTURELLI, *Costi e ricavi, investimenti e finanziamenti nelle società di calcio*, in F. BOF, F. MONTANARI, G. SILVESTRI, (eds.), *Il Management del Calcio*, Franco Angeli, Milano, 2008, 34-62.
- J. G. VILLAR, P. R. GUERRERO, *Sports Attendance: A Survey of the Literature 1973-2007*, in *Rivista di Diritto e di Economia dello Sport*, vol. 5, n. 2, 2009, 112-151.