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Original

LA VENTAJA DE JUGAR EN CASA: COMPARATIVA ENTRE LAS LIGAS PROFESIONAL Y AMATEUR DEL FÚTBOL GRIEGO

HOME ADVANTAGE: COMPARISON BETWEEN PROFESSIONAL AND AMATEUR GREEK FOOTBALL LEAGUES

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RESUMEN

El objetivo del presente estudio fue examinar las posibles diferencias entre los partidos de fútbol griego profesional y amateur en cuanto a jugar en casa y a las sanciones disciplinarias del árbitro (penalti, tarjeta amarilla y roja). Se estudiaron 1.920 partidos de Super Liga durante ocho temporadas y 3.402 partidos amateur durante tres temporadas. Para el análisis estadístico se utilizó ANOVA split-plot y tamaño del efecto se determinó. Los resultados mostraron que los árbitros concedieron más penaltis y mostraron menos tarjetas amarillas y rojas a los equipos locales en comparación con los equipos visitantes. Por otra parte, hay una significativa mayor ventaja en casa en la primera división en comparación con las divisiones inferiores. Los resultados del presente estudio podrían atribuirse al apoyo de la afición local (tamaño, densidad, intensidad), las cuestiones tácticas y los efectos psicológicos de los jugadores y árbitros. Sin embargo, los resultados deben ser interpretados con cautela ya que estos factores han demostrado ser difíciles de aislar y cuantificar y, lo más importante, parece que interactúan unos con otros.

Palabras clave: Parcialidad del árbitro, efecto del público, fútbol, Super Liga.

ABSTRACT

The aim of the present study was to examine the possible differences between professional and amateur Greek football league matches concerning home advantage and referee's disciplinary sanctions (penalty, yellow and red card). 1.920 Super League matches were studied during eight seasons and 3.402 amateur matches during three seasons. For statistical analysis ANOVA split-plot and effect sizes were determined. Results revealed that referees awarded more penalty kicks and allocated less yellow and red cards to home teams compared to away teams. Moreover, significant higher home advantage appeared in top division compared with amateur divisions. The results of the present study could be attributed to the support of home crowd (size, density, intensity), tactical issues and psychological effects on players and officials. Nonetheless, results should be interpreted with caution since these factors have proved difficult to isolate, quantify and most importantly they seem to interact with each other.

Keywords: Referee Bias, Crowd Effect, Soccer, Super League.



INTRODUCTION

It would appear that the question of whether the home advantage exists in sport has been clearly answered by the research (Clarke & Norman, 1995; Pollard, 1986; Pollard & Pollard, 2005). However the more relevant, interesting, and as yet unanswered, question is why? Research attempting to identify the factors that contribute to the home advantage (Agnew & Carron, 1994; Courneya & Carron, 1990; Pace & Carron, 1992) has largely focused on several non-exclusive factors, including rule advantages, travel factors, familiarity of home grounds, crowd effects, territoriality, special tactics, psychological factors and referee bias (Courneya & Carron, 1992; Pollard, 2008).

Referees can have a very important influence on the final result of a football match and even though they are employed to interpret the rules of football in an impartial way, they can exert considerable discretionary power (Sutter & Kocher, 2004). Research on referee bias has focused on adding extra time, awarding penalties and their allocation of yellow and red cards. It has been suggested that referees award less added time after 90 minutes in matches when the home team was ahead and more added time when the home team were behind (Dohmen, 2005; Garicano, Palacios-Huerta & Prendergast, 2005; Lucey & Power, 2004; Sutter & Kocher, 2004). Dawson et al. (2007) found that fewer cards were given to home teams and more cards awarded to away teams, after controlling for relative team quality and importance of fixtures for league outcome. Supporting evidence of referee bias in favour of home teams is offered by Boyko and his colleagues (2007). They examined yellow card awards and penalty decisions in Premiership matches and found that there was inconsistent and favourable treatment of home teams across the 50 referees considered. It has been proposed that yellow cards are ideally suited to study judgment and decision processes, because referees have a great deal of freedom with when to award such warnings or not (Unkelbach & Memmert, 2008). In addition, penalty decisions seem to play a crucial role in match outcome, since about 85% of penalties awarded result in a goal being scored. Moreover awarding a penalty is typically much more influential in the final outcome of a match than adding half a minute more

of extra time, where the probability of scoring a goal in 1 min of extra time is 2% (Sutter & Kocher, 2004).

Referee bias factors have been proven to be closely linked with crowd effect (Downward & Jones, 2007; Pollard, 2008). Studies on home advantage mostly conclude that there is considerable importance of crowd effect on the win percentage of home teams. Furthermore, Nevill and Holder (1999) summarized studies providing evidence for crowd effect and proposed two major channels by which fans are able to influence a match's outcome: Firstly, fans are able to raise the performance of home team with their constructive support. Secondly, crowd effect may influence the referees by intimidating them so that they subconsciously make decisions favouring the home team.

Home advantage is a worldwide phenomenon and although it varies considerably from country to country, it seems to be present in most studies (Pollard, 2008). The most detailed research of home team advantage in football has been conducted in the Premier League (Barnett & Hilditch, 1993; Boyko et al., 2007; Carmichael & Thomas, 2005; Clarke & Norman, 1995; Nevill & Holder, 1999; Nevill, Newell, & Gale, 1996; Pollard, 2006). Additional tournament and league research has been conducted in the FIFA World Cups (Brown et al., 2002), European Champions League (Page & Page, 2007; Poulter, 2009), German Bundesliga (Buraimo, Forrest & Simmons, 2007; Dohmen, 2008; Sutter & Kocher, 2004; Unkelbach & Memmert, 2010), Italian Serie A (Distaso, Leonida, Patti & Navarra, 2008; Lucey & Power, 2004), Spanish Primera Division (Garicano et al., 2005) and Turkish Super League (Seckin & Pollard, 2008).

Although, Greece is now a major football playing nation, with the national team participating in all recent European and world competitions and winning the 2004 European Championship, limited research has been conducted concerning home advantage and referee bias in Greek football. Pollard (2006) calculated home advantage for the domestic leagues of all countries of Europe and South America. The results of all matches (n=1580) during 1998-2003 seasons from Greek First Football Division presented a home advantage of 64.58%. Pollard and Seckin (2007) studied isolated and ethnically distinct locations in the Balkan region. They found that home advantage exists in Greece, and specifically Xanthi (a



town in the north-eastern part of Greece) where home advantage was shown at 71.8%, compared to 63.9% for the rest of Greece.

There is limited evidence concerning home advantage and referee bias in amateur leagues as well as the possible differences between professional and amateur leagues. Carron and Hausenblas (1998) present several general findings about home bias, finding an existence of home advantage in both professional and amateur teams. These authors presented home advantage in Greek Super League to be over 60% but there was no evidence for referee sanctions (yellow, red cards and penalty kicks) or when making comparison between the professional and amateur leagues. Pollard and Pollard (2005) quantified home advantage in England for over nine levels of competition for which crowd size information was available. Results presented figure to be close to 54% for amateur levels of competition while over 60% between the top four levels, despite large differences in crowd size. In a recent study, Armatas Apostolopoulos, Fragkos, Apostolopoulos and Yiannakos (2009) examined 968 amateur football matches from the 2008 - 2009 season and showed the home advantage figure to be 51%, with referees awarding the home team more penalty kicks, whilst showing them yellow cards more often than red cards.

The aim of the study is twofold. Firstly, to provide evidence of home advantage and referee's sanctions (yellow cards, red cards, penalty kicks) from Greek Super League. Secondly to detect possible differences for the above variables between Super League and regional amateur Greek leagues. Our hypothesis is that home teams should be penalized with less yellow and red cards than away teams, whilst being awarded more penalty kicks than visitors. This should be found in both professional and amateur leagues.

METHODOLOGY

Sample

Data from a total of 5322 football matches was used. Of these matches 3402 were from Amateur leagues in the area of Peloponnese and 1920 matches were from Greek Super League.

Super League (SL)

A complete record of all matches from the regular season (n=1920) played in the Greek Super League, from the start of the 2002-2003 season through to the end of the 2009-2010 season was obtained from the Galanis Sports Data database at www.galanisportsdata.com (June 2011) and from Greek Super League database at www.superleaguegreece.net (June 2011). These data were verified against each other to ensure accuracy Galanis Sports Data was founded in 1984 and during the past decade the company has undertaken, on behalf of the Greek Football Federation, the official statistical coverage of all matches of the Greek Super League. This period was chosen for the study since the Greek league expanded to 16 teams for the 2002-03 season. Since then, the league has operated with the same 16 team format, with each team playing home and away fixtures against all other teams the league. This balanced structure allows an unbiased quantification of home advantage to be made (Seckin & Pollard, 2008). The winner of a match is awarded three points; no points are awarded to the losing team, while both teams receive one point if the match ends in a draw.

Amateur Leagues (AL)

A complete record of all regular season matches (n=3402) played between the 2008-09 and 2010-11 seasons for the Argolida and Mesinia leagues were obtained from the official websites (www.epsarg.gr, www.epsmes.gr: June 2011). These are the 2 associations out of 53 who officially digitize referee's match reports and statistical results. These teams also play in the league format where team play each other, home and away.

Procedure & Design

In order to prepare a file for statistical analyses data was categorized in terms of level of expertise (Amateur League (AL) vs Super League (SL)) and season. For the purposes of the present analyses and due to the large number of matches further categorization was made. AL data was further divided according to geographical location (Argolis, Messinia) and level. In this way, a total of 10 data points for each dependent variable for Amateur level were obtained. In summary, the following analyses are performed for each dependent variable using 8 data points for SL and 10 data points for ALs. The dependent variables of the study were "number of



yellow cards per game”, “number of red cards per game” and “number of penalties per game”. Moreover, “level of expertise” was between group’s independent variable and “place of game” as within independent variable.

Statistical analysis

Statistica 6.0 was used for all analysis. ANOVA split-plot was performed for each dependent variable separately. Effect sizes for statistical differences were also determined. Values of 0.2, 0.5, and 40.8 were considered to represent small, medium and large differences respectively (Cohen, 1988).

RESULTS

The difference between the means of the SL and AL regarding the number of yellow cards per game was statistically significant, $F(1, 16) = 9.94$ ($p < 0.01$). The mean of the number of yellow cards per game for SL was 2.43 (SD = 0.21) and for AL 2.09 (SD = 0.48). Cohen's $d = 0.99$. The difference between the means of Home vs Away teams was statistically significant, $F(1, 16) = 56.58$ ($p < 0.001$). The mean for Home teams was 2.24 (SD = 0.41) and for Away teams 2.44 (SD = 0.57). Cohen's $d = 0.41$. The interaction between the two independent variables was also statistically significant $F(1, 16) = 67.29$, $p < 0.001$ and depicted in Figure 1.

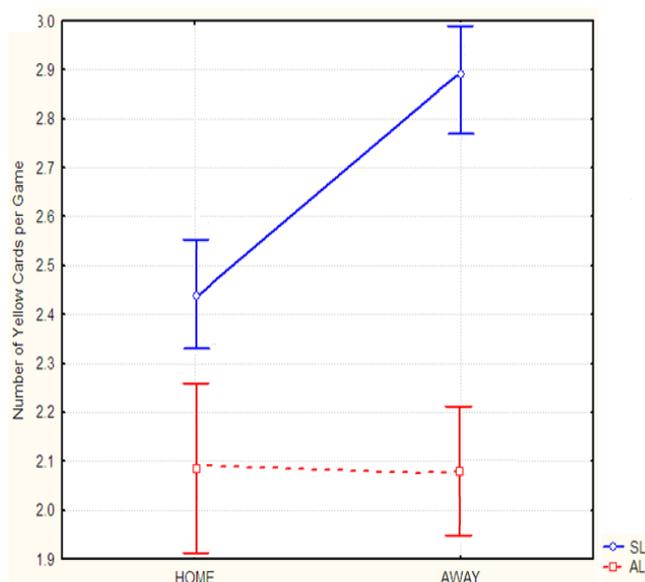


Figure 1. Number of yellow cards per game and home advantage for SL and AL.

The difference between the means for SL and AL regarding number of red cards per game was not statistically significant, $F(1, 16) = 4.27$ at the conventional 0.05 level ($p = 0.055$). The mean of the number of red cards per game for SL was 0.11 (SD = 0.02) and for AL 0.16 (SD = 0.03). The difference between the means of Home vs Away teams was statistically significant, $F(1, 16) = 19.37$ ($p < 0.001$). The mean for Home teams was 0.14 (SD = 0.03) and for Away teams 0.17 (SD = 0.03). Cohen's $d = 1.00$. The interaction between the two independent variables was also statistically significant $F(1, 16) = 7.69$ ($p < 0.01$) and is depicted in Figure 2.

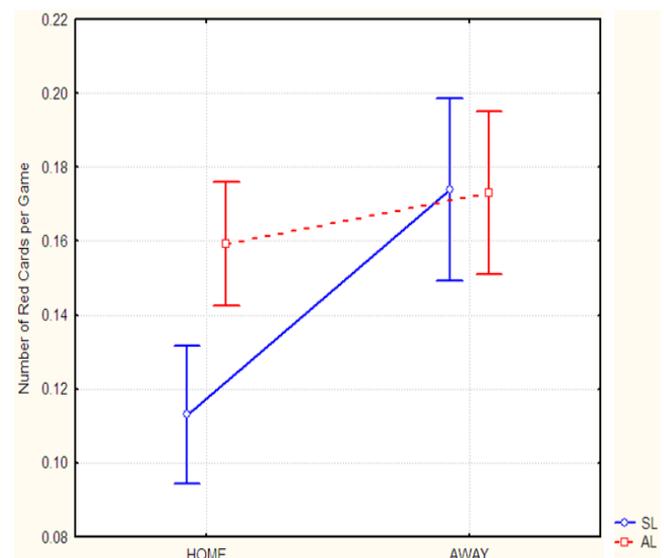


Figure 2. Number of red cards per game and home advantage for SL and AL.

The difference between the means for SL and AL regarding number of penalties was statistically significant, $F(1, 16) = 6.26$ ($p < 0.05$). The mean of the number of red cards per game for SL was 0.16 (SD = 0.01) and for AL 0.08 (SD = 0.06). Cohen's $d = 1.33$. The difference between the means of Home vs Away teams was statistically significant, $F(1, 16) = 201.84$ ($p < 0.001$). The mean for Home teams was 0.11 (SD = 0.06) and for Away teams 0.08 (SD = 0.04). Cohen's $d = 0.60$. The interaction between the two independent variables was also statistically significant $F(1, 16) = 94.04$ ($p < 0.001$) and is depicted in Figure 3.

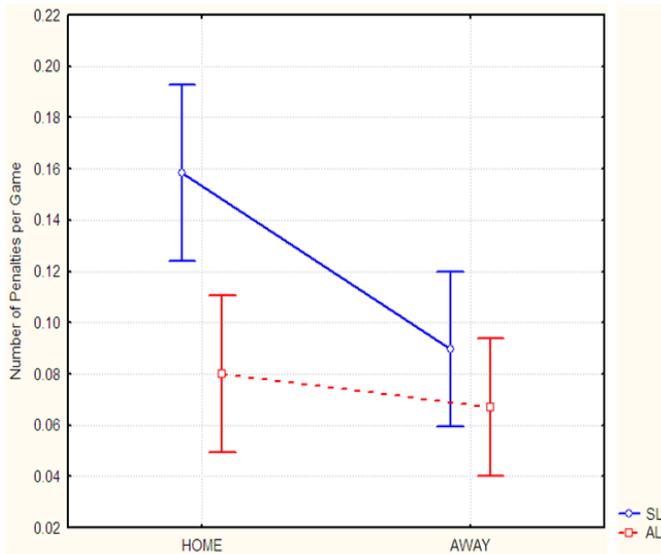


Figure 3. Number of penalties per game and home advantage for SL and AL.

DISCUSSION

Home advantage is a commonly accepted phenomenon in most sports. While many researchers have focused on factors influencing players, referee bias has been shown by a number of recent studies to be a plausible cause of the home advantage. However these results imply that referee bias and crowd factors are closely linked. Pollard (2008) concluded that it is not known whether the primary effect of the crowd is to give an advantage to the home team or a disadvantage to the away team and whether this is conveyed directly to the players or via referee decisions influenced by the crowd.

Results of the present study indicated that more yellow and red cards were awarded to away teams compare to home teams and that more yellow and red cards allocated to SL matches compared to AL matches. Previous studies have presented similar results concerning home/away issue, though most of them were correlated with crowd density. Unkelbach and Memmert (2010), examined 1530 matches from the Bundesliga where overall, 6489 yellow cards were awarded. On average, home teams were awarded 1.89 yellow cards while away 2.35 yellow cards. Most importantly, this difference in yellow cards correlated significantly with crowd density. Downward and Jones (2007) reported a similar trend for crowd size and number of yellow cards awarded against away team. They analysed 857 matches of the

F.A. Cup in England and found that 1.71 yellow cards were awarded toward away teams, whereas only 1.35 cards were awarded toward home teams; a highly significant difference.

Moreover Dawson's et al, (2007) findings are indicative of bias in favour of home teams (fewer cards given to home teams and more cards awarded to away teams, after controlling for relative team strengths and importance of fixtures for league outcomes). Boyko and his colleagues (2007) examined yellow card awards and penalty decisions in 5244 Premiership matches. Results indicated that crowd size significantly affected yellow card cautions, primarily because larger crowds reduced the number of yellow cards given to the home team. Crowd density significantly increased the number of yellow cards the away team received. Similarly, crowd size was negatively correlated with the red card differential and the number of red cards the home team received. In another study, data from total of 808 UEFA Champions League matches over a six-season period (2001-07) revealed the home team received a significantly lower number of yellow cards, red cards and committed less fouls (Poulter, 2007). Moreover, it was revealed that fouls committed had a significant overall effect on yellow and red cards, but there was still a contributing factor of location on both yellow cards and red cards with fouls committed accounted for. Pettersson-Lidbom and Priks (2010) examined 842 matches that have been played with spectators and 25 matches without spectators in the Italian soccer leagues Serie A and Serie B during the season 2006-07. Results presented that referees punished away players more harshly and home players more lightly when matches were played in front of spectators, compared to when they were not. Thus, they found significant bias, favouring home team, in terms of yellow and red cards.

In a recent study (Unkelbach & Memmert, 2010), studied twenty male referees of the German Football Association participated in an experiment finding that high volume crowd noise led to substantially more yellow cards when compared to low volume crowd noise. Presented with high volume crowd noise, referees had an approximately 10% higher probability of awarding a yellow card than compared to when the identical scene was presented with low volume crowd noise. Authors attributed the above results to referees correlating foul severity with



crowd noise. Similar results were shown by Nevill, Balmer and Williams (1999). Furthermore, Jones et al. (2002) suggest that a player's reputation can influence the number of red and yellow cards awarded.

Referee decisions on penalties have been examined by Nevill et al. (1996) by counting the number of awarded penalties in English and Scottish football leagues, showing that home teams are awarded significantly more penalties than visiting teams. Boyko and his colleagues (2007) found that crowd density had a significant positive correlation with the penalty differential and significant negative correlation with the number of away penalties; although these results could be confounded if away players convert penalty kicks at a lower rate in front of larger crowds. Sutter and Kocher (2004) examined 306 matches from German Bundesliga and revealed that in 50 out of 62 cases (81%) the home team is awarded a penalty which is legitimate, visiting teams were awarded a legitimate penalty only in 20 out of 39 cases (51%). The difference in relative frequencies is highly significant, indicating a clear home bias of referees with regard to awarding penalties. This study seems to address home bias of referees more convincingly than the often-used simple counting of awarded penalties due to the counting on both awarded and refused penalties. Finally, Plessner and Betsch (2001) observed that officials are less likely to award a penalty to a team if they have previously awarded the same team a penalty, but they are more likely to award a penalty if they have awarded a penalty to the opposing team.

As mentioned above, most of the studies concluded that the main factor contributing to home advantage is crowd. The home crowd encourages and inspires the home team to play well. Proponents of this theory note that the home advantage increases with noise and crowd density (Agnew & Carron, 1994). Evidence from American football and baseball teams whose stadia are domed, and therefore noisier, are believed to have an increased home advantage (Leifer, 1995; Zeller & Jurkovic, 1989). Even though the literature is not conclusive on this aspect, a study by Neave and Wolfson (2003) has been able to link crowd composition to physiological reaction of players. Specifically showing that players have a significantly higher testosterone level in home matches than when playing away, which might be

caused by a natural desire to defend one's "own" territory. In addition, Pettersson-Lidbom and Priks (2010) found evidence that Italian referees change their behaviour significantly in games played without spectators. The evidence provided is consistent with the idea that individuals are likely to change their behaviour under influence of social pressure (Pettersson-Lidbom & Priks, 2010). Home players and away players may also be affected differently by the presence or absence of spectators. However, they test a number of outcomes of players and find no evidence in support for this argument. This strongly suggests that it is the referee that changes his behaviour in matches without spectators rather than the players.

Crowds vent their anger with large volume and rather quickly at referees for decisions that do not favour their team. In order to control for the influence of the crowd noise on referee decisions, Nevill, Balmer and Williams (2002) have shown a video-tape of 47 tackles from an English Premier League match to 40 qualified referees, who were asked to classify a tackle as regular or irregular. Referees were aware of the home team and visiting teams. Referees were split in two groups, with one group hearing the noise of the crowd's reaction, while the other watched the tackles silently. As a result, the group of referees who heard the sound were markedly more reluctant (by about 15%) to classify tackles of home teams as irregular and they were more often uncertain in their decision. It is noteworthy that the decisions made by the group of referees who heard the noise were significantly more in line with those made by the original match referee than the decisions made by the group of referees who watched the tackles silently.

Evidence from psychology provides further guidance to explain a possible home team favouring of referees caused by crowd reactions. Referee decisions have to be made instantaneously, implying heavy time pressure on the side of referees. Wallsten and Barton (1982) have shown that under time pressure, people have the tendency to focus on the most salient cues to make a decision. The crowd noise caused by a tackle may serve as a salient, yet potentially (and probably) biased cue for the referee's decision (Wickens & Hollands, 2000). As a consequence, when facing a contentious decision, the salient cue of crowd noise (remaining rather silent when a home team player makes a tackle, but booing when a visitor tackles)



may cause a difference in assessing fouls of home players or visiting players. Another subtle form of how crowd noise influences referees may stem from the use of heuristics in decision making. Even though heuristics frequently result in systematic errors (Tversky & Kahneman, 1974), they are often used as rules of thumb to reduce complexity in judgment. If a referee is uncertain whether a tackle was regular or irregular, he might, therefore, place equal weight on the possibly biased auditory information from the crowd and on his visual information (Sutter & Kocher, 2004).

Referee bias, considering disciplinary sanctions should be judged with caution and it is necessary to have a subjective evaluation of the phase of the game and of player behaviour. Moreover, when an evaluation is made on TV it is often different from that of the referee, which is immediate and without the support of technological devices (Scoppa 2008). Even when decisions appear numerically to be in favour of a particular team, this might be the result tactical issues. In addition, teams that are behind in score may resort to more physical play in order to get back on even terms and this too may result in illegal aggression. This will generate more cards for away teams in the aggregate than for home teams because away teams are more frequently behind in a game (Thomas, Reeves & Smith, 2006). Moreover, given that home teams typically take the offensive more often than visiting teams, home teams are more likely to get into the penalty area which, in turn, might be responsible for the higher number of penalties for home teams (Scoppa, 2008). Failure to control for within game dynamics, especially the goal difference prior to a card being issued leaves investigators open to omitted variable bias and mistaken inferences over extent of bias. What is attributed as referee bias may simply result from excessive effort by the offending teams (Buraimo et al., 2007). Away teams may receive more yellow cards in the aggregate just because, on average, they spend more of the game trailing their opponents in score and therefore resort to more foul play.

Although indiscipline and pressure, is expressed partly by red card sendings-offs and contribute to negative match outcomes for a team, there are clear ambiguities arising from the thin line between strong and aggressive defending and the employment of dubious and illegal (but effective) tactics to disrupt

the pattern of opposition play. Carmichael et al, (2000) support for the notion that teams may intentionally employ dubious or illegal tactics to succeed. This would seem to accord with Goff and Tollinson's (1992) finding that rationality drives "criminal behaviour" on basketball courts as teams recognize the defensive benefits derived from fouls and respond to punishment incentives in predictable and maximizing ways.

As far as differences between leagues are concerned, the results from the present study revealed that more penalties, yellow and red cards were allocated to SL matches compared to AL matches, while home advantage was higher in SL matches but not significantly. To date the evidence presented until now is conflicting and hard to interpret. Nevill et al. (1996) also observed a significant home advantage in football that appeared to increase in divisions with larger crowds. However, the greatest home advantage in percentages of wins, away players being sent off and home penalties scored, was not in the English Premier League but in the English First Division where crowd sizes were considerably less. These results suggest that once the crowd has reached a certain size or density, a peak in the home advantage is observed (Nevill et al., 2002). These studies provide some evidence that the size and consistency of the crowd can influence the degree of the home advantage. This finding led to the suggestion that the crowd is able to either raise the performance of home competitors, or subconsciously influence the officials to favour the home team (Nevill & Holder, 1999).

On the other hand, Dowie (1982), Pollard (1986) and Clarke and Norman (1995) all noted that home advantage varied little over the four divisions of the Football League in England, despite large differences in crowd size. In a recent study, Pollard and Pollard, (2005) showed that very small differences in home advantage (home wins) exist between the first and second divisions of the leagues of France, Spain, Italy, Germany and England for the 1996-2002 seasons, even though crowds in the first divisions are larger than in the second. Moreover, for England they quantified home advantage over nine levels of competition for which crowd size was available and presented home advantage figure to be over 60% between the top four levels, despite large differences in crowd size. Below this level, home advantage dropped to around 55%, but again there was very



little difference between the five leagues analysed, despite considerable differences in crowd size, and even with average crowds of below 100. Therefore it seems that home advantage is related closely to crowd size as presented before by Nevill et al, (2002). It should be noted that Pollard and Pollard (2005) quantified overall home advantage as the number of points gained at home as a percentage of the total number of points gained in all matches and there was no data concerning referee's disciplinary sanctions.

CONCLUSIONS

This study is the first study to our knowledge, which was concerned with home team advantage in Greek football. Our results demonstrate that referee's in the Greek Super League are bias to favor home teams by awarding more penalty kicks and allocating less yellow and red cards when compared to away teams. Moreover, referees in top Greek division matches seem to favour home teams compared to amateur league matches.

The findings of the present study have implications for teams as they prepare to play away matches. As they may be expected to be penalized more frequently. Strategies that help address this (e.g. simulation training where players are penalized frequently by referees in a practice match, a 10vs11 practice match or penalty practice) may be useful preparation. Moreover, Wolfson and Neave (2004) discuss ways in which coaches and sports psychologists can prepare professional teams in an attempt to minimize the adverse effects of playing away from home. These strategies focus mostly on mental preparation and stressing the importance of concentration and discipline. The objective is to avoid being negatively influenced by a hostile crowd in an unfamiliar setting and to avoid antagonizing match officials who might be unduly influenced by the home crowd.

These findings also have implications for referees training. It could be suggested that psychological techniques such as desensitization training, may be usefully employed. In addition, the potential to use video referees deployed outside the ground, and therefore away from the influence of the crowd, for crucial match-changing decisions is a strategy worth considering.

The differences in this study between professional and amateur leagues were a result of crowd size, pressure of the result (financial impact, European qualification, relegation) and pressure by the media.

However, results should be interpreted with caution since there was no data for crowd size for both levels of performance (professional vs amateur), but also and possibly most importantly, there was no data for an intermediate level of competition, in order to have a complete analysis of all playing levels. These two issues should guide future research concerning home advantage in Greek football leagues. The support of home crowd (size, density and intensity), tactical issues and psychological effects on players and officials seem to be the most dominant causes of home advantage. These factors could operate in various ways, have proved difficult to isolate, quantify and most importantly they seem to interact with each other.

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