

Home Advantage: Comparison between the Major European Football Leagues

By Werlayne S. S. Leite*

In all professional team sports, the team playing at home derives an advantage, so, the home advantage is an important factor to consider in the competition sport. The home advantage concept is represented by the consistency that the teams win more than 50% of the matches at home. The aim of this study is to analyze the importance of playing at home for the final outcome of the games, making an analysis and comparison of this variable among the top 10 European national football leagues in the 2015-2016 season, totaling 3,223 analyzed games. The data were obtained through a Soccerstats site. To quantify the home advantage, the recovery methodology percentage of points was used. According to the results found, all leagues analyzed showed advantage for teams that have played at home, with a percentage of point gains above 50%. The average percentage found in this study for the home advantage was $58.25 \pm 2.95\%$ of the total points accumulated. However, this study presents a slightly lower index compared with similar studies. This may suggest a reduction of that variable over time. Thus, it can be concluded that playing at home in the major European leagues also brings an advantage to the final outcome of the game. Possible factors contributing to this phenomenon are presented.

Keywords: Advantage, Place of the match, Performance analysis, Soccer

Introduction

In all professional team sports, the team playing at home derives an advantage (Pollard 1986). The advantage of playing at home is an important factor to consider in the competition sport that allows us to know what effect it has, competing at home or away from home, on the outcome of sports competitions (Sampedro and Pietro 2012). Complex in nature, it has been portrayed since the first contests of English football from the late nineteenth century (Pollard and Pollard 2005a) and it remains being portrayed today (Sampedro and Pietro 2012). The home advantage concept is represented by the consistency that the teams win more than 50% of the matches at home, with which teams win more than 50% of home matches, provided that they make the same number of home and away games, facing the same opponents (Courneya and Carron 1992).

According to the literature, several potential mechanisms may offer this advantage in favor of the local team. In the case of football, several studies using data from various competitions, mainly in England, have analyzed factors that can be crucial to this phenomenon, as the crowd (Nevill et al. 1996, Pollard 1986, Wolfson et al. 2005); the familiarity with the field (Barnett and Hildtich 1993, Clarke and Norman 1995, Courneya and Carron 1992, Pollard 1986); the

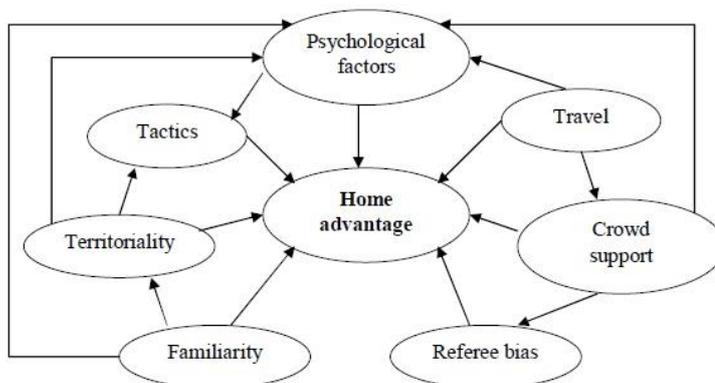
* Secretariat of Education of the State of Ceará (SEDUC), Secretariat of Education of Fortaleza (SME), Fortaleza, Brazil.

arbitration favoritism (Boyko et al. 2007, Nevill et al. 2002, Nevill et al. 1996); the effect of the displacement travels of the visitors teams (Clarke and Norman 1995, Dowie 1982, Pollard 1986, Pollard and Pollard 2005b). Other aspects such as changes in testosterone levels as a territorial defence indicator (territoriality) in the principals, especially for goalkeepers (Neave and Wolfson 2003); type of ball provided by the contracting authority (Dosseville 2007); and the adoption of more defensive tactics and cautious by the visiting team, can also contribute to the advantage of playing at home (Pollard 1986, Pollard and Pollard 2005b).

Psychological aspects have also been recommended, considering that the players believe in the existence of the advantage of playing at home, and then it is likely to increase their confidence and, consequently, contributes to the existence of this phenomenon (Nevill and Holder 1999, Pollard and Pollard 2005b, Waters and Lovell 2002). The magnitude of this advantage depends on how beliefs are reinforced by feelings generated by players and coaches (Neave and Wolfson 2003, Pollard and Pollard 2005b). Some studies have also shown that the geographic location and the occupation history of the countries can also offer differential in the advantage of playing at home (Pollard 2006, Pollard 2008, Pollard and Pollard 2005a).

Thus, both Silva and Moreira (2008) and Pollard and Pollard (2005b) argue that home advantage in football is influenced by many factors and most of these factors interact with each other (Figure 1). These factors may change the relative importance of technique, of speed, of strength and of the aerobic/anaerobic endurance of players (Barnett and Hilditch 1993, Drubscky 2003, Pollard 1986, Reilly and Gilbourne 2003), for example.

Figure 1. *Inter-relationship of Causes of Home Advantage*



Source: Pollard and Pollard (2005b).

The home advantage is a worldwide phenomenon, but varies considerably from country to country (Pollard 2008). The peculiar characteristics of each country and the characteristics of its football are important elements that can directly interfere in a sporting contest and in the results in the fields (Silva et al. 2005). Thus, the need to develop studies in different countries and leagues in order to deepen the understanding of home advantage becomes evident (Gião et al. 2015).

In this context, the aim of this study is to analyse the importance of playing at home for the final outcome of the games, making an analysis and comparison of this variable among the main European national football leagues. The application of statistics in football can strategically help a team to get better results in the field. By observing certain team patterns of behaviour in a given competition, as the characteristics of the home advantage, it is allowed to gather information that, if it is analysed in successive repetitions, it will allow us to search and develop strategies and more realistic game tactics for a team in search of positive results (Silva et al. 2005).

Materials and Methods

Sample

We analyzed all the matches of the main European national football leagues, in the season 2015-2016: Belgium (Pro League), England (Premier League), France (Ligue 1), Germany (Bundesliga), Italy (Serie A), Netherlands (Eiredivisie), Portugal (PrimeiraLiga), Russia (Premier League), Spain (La Liga), Turkey (Superliga); totalizing 3,223 matches.

Data were obtained through the website Soccerstats (www.soccerstats.com). Of the 10 leagues analysed, were randomly assigned two of these leagues, by resorting to the official data obtained through the website of their national federation. The data from these two leagues were analysed again to prove the reliability of data found in the Soccerstats site. According to the findings of this analysis, the data available on the site have a high reliability index.

Method

As a quantification method, we used the procedure introduced by Pollard (1986) for calculating the advantage of playing at home, during a league in a full season for sports in which the draw is a possible result of a match. The advantage of playing at home is calculated as the number of points earned by the principals teams, including draws, expressed as a percentage of the total points earned at home and away. There is an advantage to play at home when you get a value bigger than 50% of this ratio, which indicates that earns the most points playing at home than away. There is no advantage to play at home when they get an equal or lesser value of 50%, which indicates that they can gain equal to or less points at home or away from home.

Data Analysis

All data were analyzed using the statistical package for PC SPSS 20.0. (Lead Technologies Inc. USA). A non parametric chi-square (χ^2) analysis was used to determine the statistically significant differences and the level of significance was set at $p < 0.05$.

Results

Table 1 shows the distribution of the games and the percentage calculation of the advantage of playing at home in the main European national football leagues in the 2015-2016 season. According to the results, all the leagues presented advantage for teams playing at home: Belgium (60.7%), England (56%), France (57%), Germany (56.2%), Italy (59.3%), Netherlands (57.5%), Portugal (56.4%), Russia (55.3%), Spain (61.2%), Turkey (61%).

Table 1. *Matches Distribution in European Football Leagues and Calculation of Home Advantage*

Leagues	Matches	Home wins	Draws	Away Wins	Home advantage (%)
Belgium	240	114	59	66	60.7
England	380	157	107	116	56
France	380	160	108	112	57
Germany	306	135	71	100	56.2
Italy	380	175	95	110	59.3
Netherlands	306	137	74	95	57.5
Portugal	306	133	76	97	56.4
Russia	240	98	67	75	55.3
Spain	380	183	92	105	61.2
Turkey	305	144	78	83	61

Discussion

According to the results in Table 1, all the analysed leagues showed advantage for teams that have played at home, with percentage point gains above 50%. Three of these leagues showed high levels in the results, a percentage above 60% (Belgium, Spain and Turkey). The league that had a lower utilization rate of home points earned was the Russian league, with 55.3%. Even this rate is lower than other leagues, the percentage of points earned out of the house in the Russian League was 44.7%, giving a percentage difference between points won at home and abroad, of 10.6%, which is still an index representative. The representation of this index can also be proved by the advantage of home definition proposed by Bray (1999), where it is considered that there is an advantage to play at home when the percentage of home wins minus the percentage of away wins is bigger than 5%.

The average percentage found in this study for the home advantage was $58.25 \pm 2.95\%$ of the total points accumulated. This result corroborates the study of Garcia et al. (2013), the authors found values between 55 and 56% in the ten most competitive soccer leagues in Europe. However, compared to other similar studies, the present study shows somewhat lower rates. This may suggest a reduction in home advantage (Thomas et al. 2004). Gião et al. (2015) say that it is notorious a tendency for this decrease, having noticed that the effect of home advantage will lose influence on the level of the result. According to Pollard (2008), this variable has declined in the major leagues in Europe over the last 15 years.

According to Pollard (1986), the study of the English League between the years 1888-1984, the home advantage over a century has a 67.9% decline to 63.9%, i.e., 4% points. These data also imply that there is a constant trend downward over time, i.e. the home advantage percentages are decreasing year by year. The study by Garcia et al. (2013), for the 52 European football leagues between 2000 and 2010, this variable indicates a percentage decrease of only 2%.

In the study by Courneya and Carron (1992), home advantage was confirmed by the average percentage of home victories in various football tournaments played across Europe, with approximately 64%, in a range varying from 53% to 70% concerning the various sports investigated. Pollard and Pollard (2005b) stated that most of the major countries that play soccer in Europe have home advantage values between 60 and 65%.

The study by Marques (2002), on the Portuguese League in seasons 1960-2001, has a tendency to reduce the performance of the teams playing at home, caused a significant increase in draws. At the same time, there is an improvement in the performance of the teams when they play away from home, especially after the beginning of the nineties. Garcia et al. (2013) also stated that there has been a decline in the home advantage factor. This variable is evident only in 32 of 52 countries (61.5%) of the European Football Federations Union (UEFA).

In recent decades, football has undergone profound changes, whether in the tactical aspect, physical or technical. These changes have brought greater balance between the teams and can oppose greater resistance to this advantage cited (Silva et al. 2005). The reduction of home advantage should also be related to the fact that there is an observation and better and better knowledge of the opponents and surely there are also the best means of preparation and adaptation to locals that are usually not frequented (e.g. play at sea level or high altitude) (Gião et al. 2015).

Courneya and Carron (1992) consider that the game site study involves a reflection on relevant factors for the final result, e.g., public, travel, facilities, rules. In turn, these factors influence the psychological and behavioural states of the players, coaches and referees. Thus, these components directly influence the performance.

One of the problems about the research of home advantage is the fact that it is influenced by several variables and these variables also interact with each other. This interaction is difficult to be investigated, isolated and or quantified. However, the factors will be considered which according to the literature appear to have a greater influence over the said edge.

Familiarity with Place of the Match

Some researchers say that the familiarity with the game local conditions is a factor that can explain the home advantage (Barnett and Hilditch 1993, Clarke and Norman 1995, Matos 2009), considered by coaches and athletes as the most important aspect of this advantage (Wolfson et al. 2005). According to Pollard (1986), the aspect of familiarity can reflect up to 24% of home advantage.

The aspect of familiarity with the location allows a greater spatial awareness of the athlete from the local team, which allows a guidance/more effectively redirection in the actions arising and required in the matches (Courneya and Carron 1992, Nevill and Holder 1999, Pollard 2002). The knowledge of specific conditions, such as the influence of wind, sun positions and visual references acquired, can bring benefits when preparing and playing a game within the family environment (Dosseville 2007, Dowie 1982, Pollard 1986, Pollard and Pollard 2005b). Moreover, there is some evidence that the familiarity with local climatic conditions and with altitude has an effect favoring the home team (Pollard et al. 2008, Seckin and Pollard 2008, McSharry 2007).

Lagos-Peñas et al. (2011) observed that the distance of displacement of the players on the field was explained by the location of the game. Players of the teams playing at home have a higher total displacement in the field during matches of the Spanish League in the 2005-2006 season, showing that the home factor can create physical predisposition to the game.

Crowd Support

Regarding the fans, the teams that are successful, mention the large number of fans in the stadiums as a positive influence on their performance. Players are motivated with the crowd vibe with their moves and value the opportunity to show the fans their abilities (Gould et al. 1999). Schwartz and Barsky (1977) state that the greater the audience for a game, the greater the possibility of victory in favour of the local team. According to the authors, this advantage can reach 12%.

Agnew and Carron (1994), Nevill et al. (1996) and Nevill and Holder (1999) also found in their studies a greater influence on home advantage in that it increases the home crowd, considering that the behavior is altered by the presence of observers (Sampaio and Janeira 2005). In general, the results of most of the available studies converge on the idea that public support for the home team is a factor that positively influences the performance of these teams (Agnew and Carron 1994, Madrigal and James 1999, Zeller and Jurkovic 1988 as cited in Sampaio and Janeira 2005).

The home crowd can exert strong influence on the predisposition to perform a good game according to professional players of the English League (Waters and Lovell 2002); in addition to damage the opposing team psychologically, it influences their performance negatively (Bray and Widmeyer 2000, Thirer and Rampey 1979 as cited in Sampaio and Janeira 2005); and also exerts a strong influence on the referee's decisions through the "pressure" and intimidation imposed on the arbitration committee.

Referee Bias

Nevill et al. (1999) showed that there is overwhelming evidence that the judges can be influenced by the noise of the fans of the local team. Some studies that analysed the frequency of disciplinary sanctions applied by the

referees in football leagues in England (Carmichael and Thomas 2005), Scotland (Nevill et al. 1996), Germany (Unkelbach and Memmert 2010) and Turkey (Seckin and Pollard 2008), showed consistently that the teams playing away from home receive more sanctions than local teams.

According to the studies by Nevill et al. (1996) and Nevill et al. (2002), the referees also have a strong influence in favour of the local teams, and it is reported that the increase in the number of faults for the visiting teams (Nevill et al. 2002, Gião et al. 2015); greater amount of penalties scored in favour of the home team (Boyko et al. 2007, Nevill et al. 1996); a greater number of yellow cards (Boyko et al. 2007, Gião et al. 2015, Poulter 2009) and more red cards (Gião et al. 2015) applied to the players of the visiting teams; which may indicate an inclination of the decisions of arbitrators in favour of the mandators (Gião et al. 2015, Goumas 2012).

The studies focused on the arbitrators' decision influenced by the place of the game, has allowed us to identify a favouritism trend of the home team, resulting in making subjective decisions (Glamsner 1990, Greer 1983, Varca 1980, as cited in Sampaio and Janeira 2005); and a more difficult trial bid, the referees do not seem to manage to be objective and turn to guide the spectators to take the final decision (Nevill et al. 1999).

Travels

Clarke and Norman (1995) found evidence that the advantage of playing as local player increased depending on the distance between the teams who played with each other. However, in Europe, some studies have shown that the influence of displacement did not explain the advantage rates of playing at home in domestic competitions (Courneya and Carron 1991, Dowie 1982, Pollard 1986, Smith et al. 2000), or even those who tended to it, showed a small ratio ($r=0.07$, $p=0.0001$), considering the large number of observations that have been made ($n=10,153$ matches) (Clarke and Norman 1995).

According to Marques (2002), the improvement of communication modes and transport decreased the fatigue of the players in travel to the home of the mandators. In continental European countries, which have a well-developed transport infrastructure, travel clubs become faster, safer and more comfortable (Drummond et al. 2014). These shorter trips cause less fatigue and can still contribute to a better perception and psychological state to face in away games (Renáta and Dezso 2006, Waters and Lovell 2002).

Perhaps only in continental competitions like champions League and the UEFA League where there can be large displacements, this fact can generate a little physical stress caused by travel and fall of results at the end of matches, as reported in some studies (Pollard 2008, Pollard et al. 2008).

Conclusion

We can conclude that home advantage is not a recent phenomenon and, according to several studies, there is it in many team sports, including football. In football, this variable is influenced by many factors and these factors also interact with each other. Among the main factors we can include: familiarity with the place of the match, support of the fans, the referee bias and shift travel. According to the data found in this study, home advantage was positive, i.e. above 50% in all 10 football leagues analysed during the 2015-2016 season. Three of these leagues showed results above 60%, Spain, Turkey and Belgium. Thus, playing at home in the major European leagues is still an advantage to the final outcome of the game.

While recognizing that this variable can be decisive for the outcome of a match or a league, several authors also claims that their importance has been declining over the years. This statement could also be found through this study, which showed levels slightly lower than those reported in similar studies.

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