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ORIGINAL ARTICLE

Home advantage in football in South-West Europe: Long-term trends, regional variation, and team differences

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Abstract
We examined the trends in home advantage in the professional football leagues of France, Italy, Spain, and Portugal since the start of each league more than 70 years ago. A total of 81,185 games were included, involving 244 different teams. Home advantage was quantified each season for each country as the number of points gained at home expressed as a percentage of all points gained at home and away. Home advantage was generally high in the early years of each league, especially in Spain and Italy (over 70%). There were then considerable fluctuations up to the late 1970s. During this time, home advantage was consistently highest in Spain, which could be explained by greater regional autonomy and more distinct local cultural identity. Since then there has been a major decline in all the countries, especially since the late 1990s. Each country has experienced its lowest ever level (60% or less) during the last four seasons. Possible explanations for this include the effects of changes that have taken place in the rules of football, such as greater use of substitutes and a series of new laws intended to discourage defensive play. In addition, free agency coupled with the rapid commercial development of football has weakened the relationship between players and their home city and fans. There were significant differences between teams within France, Italy, and Portugal (all $P < 0.001$) but not Spain ($P = 0.145$). Home advantage was higher for teams from the islands of Corsica and Sicily ($P < 0.001$) and to a lesser extent Sardinia ($P = 0.095$). It was lower in teams that play in the four capital cities and also in Milan, whose two teams share the same stadium. This is consistent with the belief that the territorial feelings fostered in isolated, culturally distinct communities can lead to increased home advantage, while the reverse is the case in large cosmopolitan urban areas.

Keywords: *Home advantage, football, team ability, territoriality*

Introduction

Home advantage continues to be an important factor in football, although the exact mechanism through which it affects the outcomes of games is still not well understood. Pollard (2008) has provided a comprehensive literature review of home advantage in football, classified by the main explanations that have been considered. These are crowd effects, travel effects, familiarity, referee bias, territoriality, tactics, rule changes, and psychological factors.

Research has been based mainly on observational studies, most of which used data from professional football in England. Pollard and Pollard (2005) investigated long-term trends. Their results include the finding that home advantage has existed since the start of professional league football in 1888 and that it was at its highest in the early years of the league. Furthermore, its magnitude has always been similar across the top four tiers of league play in England. It declined immediately after the Second World War and has dropped steadily since the early 1980s. The recent decline has also been noted in studies by Jacklin (2005) and by Thomas and colleagues (Thomas, Reeves, & Davies, 2004), both of which suggested that the most likely explanation was the change in awarding three points for a win, which took place in England in 1981. Smith (2003) had previously observed a similar drop in professional ice hockey and basketball in North America. His explanation was an erosion of the social bases of home advantage whereby teams had become less a representation for local communities and more

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a vehicle for profit-driven owners and league marketing strategies, making maximum use of highly paid athletes moving from team to team as a result of free agency and with much less identity with the local community.

Against this background, our first aim was to analyse final league tables from four countries of South-West Europe (France, Italy, Portugal, and Spain), each with long established national professional leagues. Since very little is known about home advantage from a historical perspective, this was done from the start of their national professional league (all of which began around 1930) in order to assess long-term trends.

Our second aim was to use the same set of data to explore variations in home advantage between teams and between regions of the four countries. This was done with the intention of shedding further light on the little understood concept of territoriality as an explanation for home advantage.

The first published investigation into home advantage in football was contained in *The soccer tribe*, a book by Morris (1981). In a chapter entitled "Awayitis. The challenge of playing on a rival territory", Morris explored the broad psychological problems faced by an away team in terms of invading the home territory of an opponent and described what he called a "territorial reaction" as the fundamental cause of home advantage. Subsequent research on home advantage in football has dwelt more on the effects of crowd, travel, familiarity, and referee bias, the results of which are summarized in Pollard (2006a). It was Neave and Wolfson (2003) who revived and refined the concept of territoriality by demonstrating that home players experienced a significantly greater increase in testosterone before the start of a game. In a subsequent publication, the same authors expanded on the ways in which physiological and psychological factors might affect home advantage and laid out a more detailed framework for explaining the ways in which territoriality might operate (Neave & Wolfson, 2004).

Home advantage has recently been established as a worldwide phenomenon showing interesting regional variations with the potential to shed further light on the causative factors involved (Pollard, 2006b). For example, home advantage was found to be unusually high in the Balkan countries of South-East Europe and in the Andean nations of South America. A heightened sense of territoriality in isolated communities with a history of conflict was hypothesized to be the reason. A more detailed analysis of home advantage in the Balkans and Turkey found that home advantage was at its highest for teams based both in remote locations and from ethnically distinct communities (Pollard & Seckin, 2007).

In this context, our interest was to determine whether this finding could be replicated for teams in South-West Europe. For an initial analysis, the following culturally distinct locations were selected:

- *Corsica (France), Sardinia (Italy), and Sicily (Italy)*. All are large islands in the Mediterranean with strong and distinctive historical and cultural identities. Each one has its own language.
- *Basque Country (Spain)*. An autonomous community in northern Spain, the Basque Country has a strong ethnic and cultural identity, a vigorous nationalist movement, and its own language.
- In addition, the island communities of *Madeira (Portugal)* and the *Balearic and Canary Islands (Spain)* were selected as being separate from their respective mainlands.

Since this was an exploratory observational study, other unusual patterns of home advantage for groups of teams with common characteristics were sought and investigated.

Methods

Scope of study

For the four countries (France, Italy, Portugal, and Spain), the season in which a national professional league began was taken as the starting point, continuing to season 2006–07. Only seasons in which a balanced schedule of games was played between all teams were included. As a result, the analysis was based on the following seasons:

- *France*. Balanced competition began in season 1933–34. The national league did not operate for six seasons during the Second World War, which means that seasons 1939–40 to 1944–45 were not included.
- *Italy*. The national professional league (Serie A) began in season 1929–30. Seasons 1943–44, 1944–45, and 1945–46 were omitted due to the disruption caused by the Second World War.
- *Portugal*. The national league began in 1934–35 and has operated continuously since that time.
- *Spain*. The national league (La Liga) began in 1928–29 and has been in operation since then with the exception of three seasons (1936–37, 1937–38, and 1938–39), which were cancelled due to the Spanish Civil War.

The final data set for the study covered 79 seasons, with 81,185 games involving 244 different teams.

Sources of data

Complete home and away tables for each season for each country were obtained from two websites: www.rsssf.com and www.lfp.es. Several checks for internal consistency were made. For example, the total of home wins must equal the total of away losses in a season; for each team, the sum of wins, draws, and losses should equal the number of games played in a season. Between 10 and 20 minor inconsistencies were found in this way for each country and the values were corrected.

Quantification of home advantage

To quantify the magnitude of home advantage for a league over a complete season, the number of points won at home by all teams was expressed as a percentage of the total number of points won at home and away. For a league with a balanced schedule of games, this gives an unbiased estimate of home advantage and the method has been used previously to analyse long-term trends in a number of sports (Pollard & Pollard, 2005). However, if this procedure is applied to individual teams, several problems arise, so that to compare teams making use of this simple method of quantifying home advantage, it was necessary to control for confounding factors that might affect the magnitude of the observed values.

Adjusting for team ability and temporal variation

In any given season, the calculated home advantage value for a team will depend to some extent on two factors not directly related to the causes of the advantage. First, the overall home advantage for all teams that season will affect the value of each individual team. This poses a problem, since home advantage varies considerably over time and the individual teams being compared will not have participated in the same seasons as each other due to the system of promotion and relegation used by the countries under analysis. Second, team ability is known to influence the magnitude of home advantage when calculated in the manner proposed. This is because the difference in the ability of two teams is often likely to outweigh the relatively small effect of home advantage in determining the result of a game. Thus strong teams that win the majority of their games both at home and away will not be able to achieve a high calculated value for home advantage. This problem has previously been recognized for football in several studies (Barnett & Hilditch, 1993; Bray, Law, & Foyle, 2003; Clarke & Norman, 1995; Dawson, Dobson, Goddard, & Wilson, 2007), each of which used a different method for controlling for ability. In the present study, the methodology used was based on that introduced for a similar situation for basketball (Pollard & Gómez, 2007), and later adapted for football in Brazil (Pollard, da Silva, & Nísio, 2008). To control for ability, the ability of a team in a given season was first quantified as the percentage of games the team won during the season, incorporating drawn games by counting them as half a win each. Home advantage for each team was subsequently adjusted for team ability by using the residual values after regressing home advantage on ability. For each team, its residual value represented the amount by which its home advantage differed from what would have been expected from a team of that ability. In the present study, a preliminary investigation showed a significant negative linear relationship between the calculated home advantage and team ability for each of the four countries. To control for both annual fluctuations in home advantage and for differences in ability, the following procedure was adopted for the comparison of individual teams. Each country was analysed separately. A multiple regression analysis was used, the observational units being each team each season (referred to as a "team season") and the dependent variable the calculated home advantage. The explanatory variables were the overall home advantage for the league during the season, the ability of the team that season, and the interaction between these two factors, since this proved to be significant for each of the four countries. The residual value for each team each season thus quantified the amount by which its home advantage differed from what would be expected for a team of that ability in that season. For each team the mean of these residual values was calculated for the number of seasons for which it participated in the league. The team's adjusted home advantage was then estimated by adding or subtracting this amount from the overall home advantage for the country under analysis. As a result, the team and regional measures of home advantage were all adjusted to control for team ability, as well as for annual fluctuations in home advantage, which could also have had a confounding effect on the comparisons being made.

Analysis

Since the identification of long term-trends was essentially an exploratory task, simple line graphs were constructed for each country with annual home advantage plotted as a time series against the seasons. To better compare the four countries, their graphs were smoothed and plotted on a single graph using the lowess method (Cleveland, 1979). A smoothing constant of 0.2 was selected,

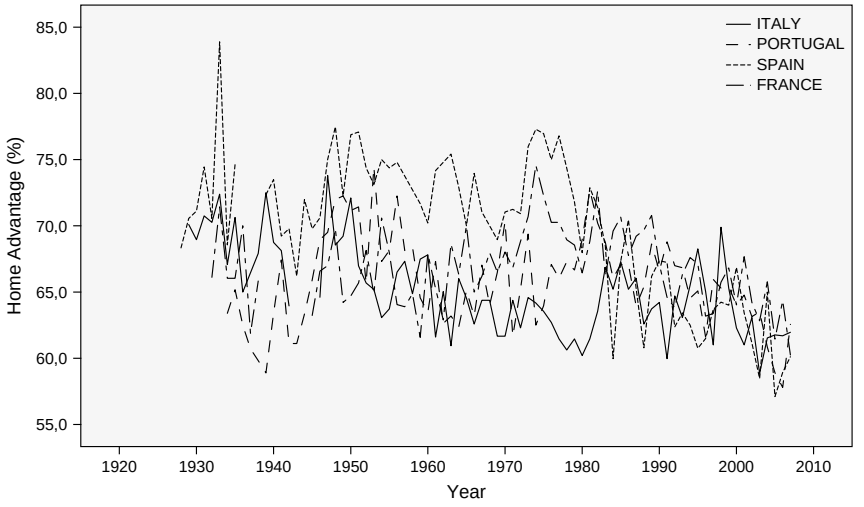

Figure 1. Long-term trends in home advantage for France, Italy, Portugal, and Spain.

since this avoided excessive smoothing and best preserved the main features of the unsmoothed graphs.

For a global comparison of all individual teams, a one-way analysis of variance (ANOVA) was performed for each country using the residual values described above as the response variable. To test the original hypotheses described in the Introduction, teams were grouped into a specific region and then compared against the rest of the country using a standard one-sided *t*-test based on the residual values. To identify other teams, or groups of teams, with unusually high or low home advantage, teams were ranked in descending order of adjusted home advantage. This was done separately for each country and restricted to teams with at least 10 seasons of data to avoid problems with small sample sizes. The omitted teams constituted only 8.4% of the team seasons in the original data set. Subsequent testing was two-sided, since there were no prior hypotheses specifying the expected direction of the effect.

Results

Long-term trends

The long-term trends in home advantage for each of the four countries are shown in Figures 1 and 2. The most striking feature is the steady decline in home advantage that has occurred in all four countries since around 1980. For France and Spain, which had higher home advantage than the other countries, this decline began a decade earlier. Despite a slight levelling off in the 1990s, the decline since then has continued to the extent that home advantage is now at its lowest level ever for all four countries. Home advantage was consistently higher in Spain from the start of the leagues up to about 1980, with figures

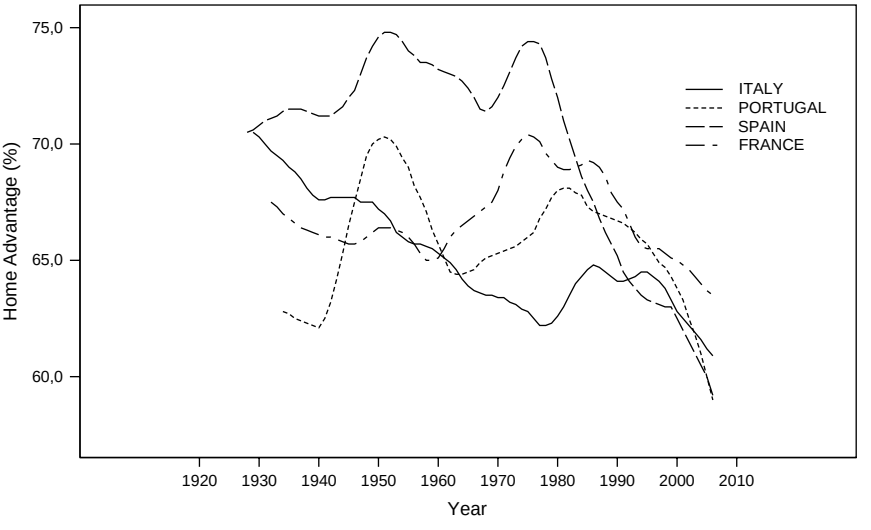

Figure 2. Comparison of countries after smoothing of home advantage trends.

mostly above 70%. Other features of the figures include the existence of home advantage at the start of each league, high levels in the late 1940s, and a decline during the 1950s. The four countries showed different trends in home advantage from about 1960 to1980, at which point the general decline described above had started to take place.

Turning to specific countries, home advantage in France fell to a low level in the season immediately after the end of the Second World War. A peak figure of 75% was reached in 1974–75, while season 2005–06 saw home advantage fall to its lowest level ever (61%). Italy also had a low home advantage immediately after the War, but the following season (1947–48) saw the advantage soar to its highest level ever (74%). Season 2003–04 was the lowest ever at 59%. In Portugal, home advantage was at its highest in the late 1940s and early 1950s with the peak being reached in 1953–54 (74%). There has been a rapid decline in the last decade with the most recent season analysed (2006–07) producing the lowest level ever at 58%. For Spain, home advantage was at a high level, over 70%, immediately before and after the Spanish Civil War. During this period, season 1933–34 had by far the highest level of any year of any country in the study, with home advantage rising to 84%. As with the other countries, home advantage has recently fallen to its lowest level ever; in the case of Spain, this was 57% in 2005–06. The fall in home advantage in Spain has been especially dramatic since the country had figures above 70% almost continuously from 1929 to 1983. With three of the last four seasons showing home advantage below 60%, Spain has gone from a long period in which home advantage was easily the highest among the four countries, to what is now the lowest.

Regional variation and team differences

Table I gives the results of the investigation of differences between the individual teams after controlling for team ability and annual difference in overall home advantage. A summary of the main features of the data for each country is also shown. There is a clear rejection of the hypothesis of no difference for the teams of France, Italy, and Portugal (all $P < 0.001$) but not Spain ($P = 0.145$). Table II shows the results of testing the initial hypotheses about increased home advantage in teams from specific regions. Home advantage in Corsica was markedly greater than throughout the rest of France ($P < 0.001$). The same applies to Sicily with respect to the rest of Italy ($P < 0.001$) and to a lesser extent Sardinia ($P = 0.095$). In Portugal, home advantage on the island of Madeira was greater than on the mainland, but this failed to reach statistical significance ($P = 0.214$). These results are in contrast to the three selected regions in Spain (Balearic Islands, Canary Islands, and the Basque Country), none of which had home advantage significantly different from the rest of Spain (all $P > 0.50$).

Tables III, IV, V and VI show the adjusted home advantage for all teams that participated in 10 or more seasons. This restriction ensured that the effect of an occasional season when home advantage might be unusually high or low for whatever reason would be minimal. For example, home advantage might be temporarily affected for a team moving into the top division for the first time, or by moving to a new stadium. For each country the teams are ranked in descending order of adjusted home advantage. The convention adopted was to use the full name of the team in the local language, together with the English version of the name of the city in which the team plays. These tables were inspected for unusual patterns of results. It was immediately apparent that home advantage in the capital cities of each of the four countries was low. To investigate this further, the combined home advantage of teams from each capital city was compared with the rest of the country and the results summarized in Table VII. Home advantage for the teams in Paris was significantly lower than for the rest of France ($P < 0.001$). For the three teams in Madrid, their combined home advantage was also lower than elsewhere in Spain ($P = 0.011$). The same trend was evident in Rome, but the difference compared with the rest of Italy was not statistically significant ($P = 0.219$). The eight teams from the city of Lisbon had lower home advantage than the rest of Portugal ($P = 0.045$). There were an additional nine teams within metropolitan Lisbon, an officially recognized region extending up to about 50 km from the centre of Lisbon itself. If the 17 teams in metropolitan

Table I. Summary of data for each country with results of ANOVA for testing difference in home advantage between teams

Country	Number of seasons	Mean annual home advantage	Number of teams	*P*-value for test of difference between teams
France	68	66.93%	62	<0.001
Italy	75	65.16%	59	<0.001
Portugal	73	65.76%	68	<0.001
Spain	76	69.94%	55	0.145

Table II. Adjusted home advantage in selected regions

Region	Number of teams	Number of team seasons	Within region	Rest of country	Difference	*P*
Corsica (France)	2	38	73.85%	66.72%	+7.13%	<0.001
Sardinia (Italy)	1	28	66.31%	64.99%	+1.32%	0.095
Sicily (Italy)	3	35	70.26%	64.99%	+5.27%	<0.001
Madeira (Portugal)	3	40	66.54%	65.73%	+0.81%	0.214
Balearic Is. (Spain)	1	21	68.44%	69.97%	−1.53%	0.839
Canary Is. (Spain)	2	43	69.96%	69.97%	−0.01%	0.503
Basque Country (Spain)	6	189	69.95%	69.97%	−0.01%	0.502

Lisbon are compared with the rest of Portugal, the difference in home advantage is greater than it was for the city of Lisbon alone ($P<0.001$). From Table V, it was clear that two teams in Portugal had home advantage that was much greater than elsewhere. These teams were from Faro and Olhão, two towns in the Algarve in the extreme south of Portugal, a few kilometres from each other. Their combined home advantage was 71.1%, compared with 65.6% for the rest of Portugal, a difference that was highly significant ($P<0.001$).

Discussion

Long-term trends

The most striking feature of the long-term pattern of variation in home advantage has been the recent

Table III. Teams in the national league of France ranked in descending order of home advantage, adjusted for team ability and annual league home advantage

Team	City	Number of seasons	Adjusted home advantage (%)
SC Bastia	Bastia (Corsica)	28	74.4
FC Sète	Sète	15	72.6
AC Ajaccio	Ajaccio (Corsica)	10	72.4
Nîmes Olympique	Nîmes	35	68.9
Lille OSC	Lille	53	68.8
OGC Nice	Nice	47	68.6
Olympique de Marseille	Marseille	56	68.5
Montpellier HSC	Montpellier	26	68.1
Stade Rennais FC	Rennes	49	68.0
Stade Lavallois	Laval	13	67.9
FC Rouen	Rouen	19	67.7
AS Cannes	Cannes	21	67.7
AJ Auxerre	Auxerre	26	67.7
FC Metz	Metz	55	67.4
FC Girondins de Bordeaux	Bordeaux	54	67.3
AS Saint-Étienne	Saint Étienne	54	67.2
Racing Club de Lens	Lens	54	67.2
Toulouse FC	Toulouse	38	67.2
CS Sedan Ardennes	Sedan	23	67.2
SCO Roubaix	Roubaix	13	66.9
FC Sochaux	Montbéliard	58	66.8
RC Strasbourg	Strasbourg	55	66.7
Troyes AC	Troyes	14	66.5
Stade Brest 29	Brest	10	66.5
Olympique Lyonnais	Lyons	49	66.5
FC Nantes	Nantes	44	66.5
AS Monaco FC	Monaco	50	65.2
Le Havre AC	Le Havre	23	65.1
Stade de Reims	Reims	29	65.0
Sporting Toulon Var	Toulon	12	64.7
AS Nancy	Nancy	38	64.6
Valenciennes FC	Valenciennes	26	64.2
Paris Saint-Germain FC	Paris	34	64.1
Angers SCO	Angers	24	63.5
Racing Club de France	Paris	29	62.1
Red Star FC	Paris	15	61.3
Stade Français	Paris	15	59.2

Table IV. Teams in national league of Italy ranked in descending order of home advantage, adjusted for team ability and annual league home advantage

Team	City	Number of seasons	Adjusted home advantage (%)
Calcio Catania	Catania (Sicily)	10	71.8
US Città di Palermo	Palermo (Sicily)	20	69.5
AC ChievoVerona	Verona	24	69.3
Calcio Padova	Padua	16	68.8
US Foggia	Foggia	11	68.7
Perugia Calcio	Perugia	13	68.6
Novara Calcio	Novara	12	67.9
US Avellino	Avellino	10	67.8
Pro Patria	Busto Arsizio	14	67.5
Ascoli Calcio 1898	Ascoli	16	67.5
US Alessandria Calcio 1912	Alessandria	13	66.7
AS Livorno Calcio	Leghorn	15	66.4
Parma FC	Parma	17	66.3
Cagliari Calcio	Cagliari (Sardinia)	28	66.3
SSC Venezia	Venice	12	66.3
Calcio Como	Como	13	66.1
AS Bari	Bari	28	66.0
US Triestina Calcio	Trieste	26	65.9
Modena FC	Modena	13	65.7
Torino FC	Turin	66	65.6
Juventus FC	Turin	74	65.4
ACF Fiorentina	Florence	69	65.4
AC Cesena	Cesena	10	65.2
Reggina Calcio	Reggio Calabria	10	65.1
Genova CFC	Genoa	40	64.9
SSC Napoli	Naples	61	64.8
Bologna FC 1909	Bologna	62	64.8
SS Lazio	Rome	64	64.7
AS Roma	Rome	74	64.3
US Lecce	Lecce	12	64.3
Vicenza Calcio	Vicenza	30	64.1
FC Internazionale Milano	Milan	75	63.8
SPAL 1907	Ferrara	16	63.8
UC Sampdoria	Genoa	59	63.7
Atalanta BC	Bergamo	47	63.7
Brescia Calcio	Brescia	21	62.9
AC Milan	Milan	73	62.4
Udinese Calcio	Udine	34	61.0

general decline, the start of which can be traced to around 1980 in all four countries. It has continued to the present, if anything accelerating since the late 1990s, to the extent that home advantage is now at its overall lowest level ever. This decline is especially evident in Spain and Portugal, less so in Italy. A similar pattern of falling home advantage has been shown in the top four tiers of professional football in England (Pollard & Pollard, 2005). This has been further investigated by Jacklin (2005), who concluded that the introduction of three points for a win before the 1981–82 season was the likely cause. However, this points system was not adopted in the four continental European countries until the mid-1990s and so cannot possibly be the explanation for the observed decline during the 1980s. It is interesting that home advantage in professional basketball and ice hockey in North America has also been in sharp decline since the early 1980s (Pollard & Pollard, 2005), with Smith (2003) providing an explanation based on the sociological aspects of home advantage. He argued that there had been a loosening of the bond between players and fans, due especially to free agency, and that this was contributing to a weakening of the traditional way in which a team was seen as a representation of its local community. It is not difficult to see the same situation arising in football in Western Europe, although the timing of the changes that have taken place would appear to be during the 1990s rather than the 1980s. Lucrative television contracts, the creation of the Champions League (1992), and the Bosman Ruling (1995) have all had a major impact on player salaries and player movement within the European Union.

The 1990s also witnessed a number of important changes to the laws of the game, any one of which

Table V. Teams in the national league of Portugal ranked in descending order of home advantage, adjusted for team ability and annual league home advantage

Team	City	Number of seasons	Adjusted home advantage (%)
SC Farense	Faro	23	71.3
SC Olhanense	Olhão	15	70.9
Boavista FC	Oporto	50	68.6
Lusitano Évora	Évora	14	68.1
SC Covilhã	Covilhã	15	67.9
Leixões SC	Matosinhos	22	67.9
FC Penafiel	Penafiel	12	67.6
CS Marítimo	Funchal (Madeira)	27	67.5
FC Porto	Oporto	73	67.4
Rio Ave FC	Vila do Conde	14	66.9
SC Braga	Braga	51	66.8
SL Benfica	Lisbon	73	66.3
Portimonense SC	Portimão	13	66.1
Varzim SC	Póvoa de Varzim	21	65.9
Vitória SC	Guimarães	62	65.5
Sporting CP	Lisbon	73	65.4
Gil Vicente FC	Barcelos	14	64.8
SC Salgueiros	Oporto	24	64.7
CF Belenenses	Lisbon	69	64.5
UD Leiria	Leiria	14	64.2
Vitória FC	Setúbal	59	64.1
SC Beira-Mar	Aveiro	24	63.9
FC Barreirense	Barreiro	24	63.8
Académica	Coimbra	55	63.7
GD Chaves	Chaves	13	63.7
CF Estrela da Amadora	Amadora	14	63.6
Atlético CP	Lisbon	24	63.3
GD Estoril-Praia	Estoril	20	63.2
SC Espinho	Espinho	11	62.9
GD Fabril	Barreiro	23	60.3

could have had a small effect on home advantage, but when combined together might have been a contributing factor to the observed decline. These changes can be classified under the following two headings:

1. Rule changes to deter defensive play. These included harsher sanctions against the so-called professional foul (1990), several changes to the offside rule in favour of the attacking team (from 1990), restrictions on the goalkeeper when receiving a back pass (1992), and instructions to the referee to penalize more severely the tackle from behind (1996). In addition to these measures, awarding three points for a win was introduced into the French and Italian leagues in 1994–95 and in Spain and Portugal a year later. The purpose of all these changes was to produce a more positive approach from the defending (usually the away) team and it could be argued that this might have had the effect of reducing home advantage.

2. Rules changes allowing more intervention from coaches. The number of substitutes allowed had been increasing during the 1980s and reached its present form of three unrestricted substitutions in 1995. The extent to which coaching was permitted from the sidelines had been something of a grey area in football, but in 1993 this was formalized to allow unlimited coaching during the game from inside a newly created "technical area" near the field of play. Before 1995, the laws of the game called only for a 5-min half-time interval, although in practice this was interpreted not to include the time taken from the dressing room to the field of play so that the actual break usually amounted to about 10 min. In 1995, the laws were amended to allow a total of 15 min for the half-time interval. All these changes have given coaches more time and opportunity to influence the tactical development of a game. Tsonis and Tsonis (2001) referred to this in-game interaction between players and coaches as "information transfer" and hypothesized that it played a role in determining home advantage. This was based on a comparison of professional sports and the fact that home advantage is lowest in baseball where unlimited information transfer is permitted, and is highest in football (soccer) where the continuous action of the game, without the time-outs allowed in basketball and ice hockey, allows minimal contact between players and coaches. If information transfer does have an effect on home advantage, then the increase

Table VI. Teams in the national league of Spain ranked in descending order of home advantage, adjusted for team ability and annual league home advantage

Team	City	Number of seasons	Adjusted home advantage (%)
Granada CF	Granada	17	72.0
RC Celta de Vigo	Vigo	45	71.6
Real Racing Club	Santander	39	71.4
RCD Espanyol	Barcelona	72	71.2
Real Valladolid	Valladolid	37	71.2
Real Sociedad	San Sebastián	62	71.1
CD Alaves	Vitoria	11	71.1
Sevilla FC	Seville	63	70.9
UD Salamanca	Salamanca	12	70.6
Real Oviedo	Oviedo	38	70.5
RC Deportivo	A Coruña	37	70.3
CA Osasuna	Pamplona	29	70.3
Hércules CF	Alicante	19	70.2
Valencia CF	Valencia	73	70.1
Elche CF	Elche	19	70.1
Real Zaragoza	Zaragoza	54	70.0
UD Las Palmas	Las Palmas (Canary Is.)	31	70.0
CD Tenerife	Santa Cruz (Canary Is.)	12	70.0
CD Sabadell	Sabadell	13	69.9
FC Barcelona	Barcelona	76	69.8
Cádiz CF	Cádiz	12	69.6
CD Castellón	Castellón	11	69.1
AC Bilbao	Bilbao	76	69.1
Real Madrid	Madrid	76	68.9
Real Betis	Seville	45	68.6
RCD Mallorca	Palma (Balearic Is.)	21	68.4
Rayo Vallecano	Madrid	12	68.4
Atlético de Madrid	Madrid	70	68.4
Real Murcia	Murcia	17	68.2
Real Sporting de Gijón	Gijón	36	68.0
CD Málaga	Málaga	27	67.1

of such transfer in the 1990s in football could be interpreted as a contributing cause for the decline in home advantage.

In addition to these rule changes, there were other developments during the 1990s that could have had an impact on home advantage. Following the Taylor Report in England, all-seater stadiums were mandated for the Premier League from the 1994–95 season. France, Italy, Portugal, and Spain all followed this lead during the next 5 years, so by 1999 all games in the countries under analysis were being played in all-seater stadiums. The inevitable effect has been to somewhat dilute the noise and intensity of crowd support, one of the main hypothesized explanations for home advantage. Crowd support is believed to operate both directly from the fans to the players and indirectly by influencing referee decisions. Thus it is possible that the rapid adoption of all-seater stadiums might have been a contributing factor to the decline in home advantage. Finally, the rapid commercialization of football in Europe since the early 1990s has led to potentially huge rewards to owners, coaches, and the players. A more professional approach to preparing teams has followed, with more input from sports psychologists, although there is no data quantifying this increase. Preparation for games is likely to include techniques to cope with the perceived disadvantage of playing away from home, so that a decline in overall home advantage might be expected. Similarly, one would expect full-time professional referees to be less likely to be influenced by crowd reaction, avoiding subconscious referee bias, which has previously been

Table VII. Adjusted home advantage in capital cities

Capital city	Number of teams	Number of team seasons	Within city	Rest of country	Difference	*P*
Paris (France)	6	97	62.27%	67.31%	−5.04%	<0.001
Rome (Italy)	2	138	64.48%	65.24%	−0.76%	0.219
Lisbon (Portugal)	8	256	64.91%	66.03%	−1.12%	0.045
Metropolitan Lisbon	17	409	64.29%	66.66%	−2.37%	<0.001
Madrid (Spain)	3	158	68.63%	70.13%	−1.50%	0.011

shown to be a plausible factor in home advantage (Dawson et al., 2007; Nevill, Balmer, & Williams, 2002).

In addition to the recent decline, other features of the long term pattern of home advantage are evident. All four leagues saw home advantage present in their early years of existence, a striking feature that was also apparent when the Football League in England started in 1888. Lack of familiarity in and around opposing stadiums, coupled with travel that was more tiring than it is now are possible explanations. In the case of Spain, the situation was compounded by increasing regional tension prior to the Spanish Civil War, which began within a decade of the start of professional football in Spain. During this time, home advantage gradually increased, reaching an astonishing 84% in season 1933–34, with a greatly increased sense of territoriality in republican and nationalist regions as a possible explanation. In France there was a drop in home advantage in the year immediately following the end of the Second World War, following a 6-year suspension of the league. A similar drop in England has been noted, with loss of familiarity being advanced as a possible explanation (Pollard & Pollard, 2005).

Until 1980, a noticeable feature is that home advantage is consistently higher in Spain than in the other countries. Compared with France, Italy, and Portugal it could be argued that Spain has always been a country with more distinctive regional identities. Indeed, Spain is divided into autonomous communities with Galicia, the Basque Country, and Catalonia designated "historical nationalities" and even preserving their own language, as does the Valencian Community. As in the Balkans (Pollard, 2006b), this could have produced a heightened sense of community and territoriality, both contributing to the overall high home advantage seen in Spain during this period.

Regional variation and team differences

Turning to the analysis of specific teams, or groups of teams in a specific region, the most striking finding is the high home advantage for teams playing on the Mediterranean islands of Corsica (France) and Sicily (Italy). Both teams in Corsica (Bastia and Ajaccio) had home advantage that was well above the overall French average (Table III), with Bastia's figure of 74.4% being the highest for any team in the four countries under analysis. The two main teams in Sicily (Catania and Palermo) had the highest home advantage values in Italy (Table IV). The third Sicilian team, Messina, also produced a high figure (69%), but this was based on only five seasons in Serie A. Corsica and Sicily both have strong historical traditions and distinctive cultural identities, as well as their own languages. Their high home advantage is therefore consistent with the theory that isolated teams in ethnically distinct communities have increased home advantage due to a more intense feeling of territoriality. Of other locations that were specifically investigated, teams in the islands of Sardinia and Madeira had home advantage that was above the mean for their countries, but failed to reach statistical significance. In the three locations in Spain (the Balearic Islands, the Canary Islands, and the Basque Country), home advantage was no different from elsewhere in the country. There are several possible explanations for this finding. The two island communities, although relatively isolated from the Spanish mainland, do not have populations with the same distinctive ethnic and cultural traditions that are present in Corsica and Sicily. Although this cannot be said of the Basque Country, it is a region that is not physically isolated from the rest of Spain. Furthermore, home advantage in Spain has generally been higher than in the other three countries, to the extent that all teams in Spain have home advantage values that are above the means of France, Italy, and Portugal (Tables I and VI). Thus although home advantage in the three regions originally highlighted is not high in comparison to other teams in Spain, each is high when compared with teams in the other countries.

The two teams in Portugal with the greatest home advantage, Faro and Olhão, are located in towns close to each other in the extreme south-east of the country, with their isolated location being a possible explanation. The finding that teams playing in the four capital cities had generally lower home advantage is consistent with a similar observation made about London teams in the 1980s (Clarke & Norman, 1995) and teams from Istanbul (Seckin & Pollard, 2008). This was especially apparent in Paris (Table III), with Stade Français having the lowest home advantage of all teams in the four countries studied, and the other three teams from Paris only slightly better home advantage. When there are several teams from the same city, especially a large cosmopolitan capital city, there is likely to be less of a sense of a team being an integral part of a particular community, with implications for home advantage that have been discussed by Smith (2003). A weakened feeling of territoriality is also likely in a city regularly seeing visitors from both within the country and abroad. A somewhat similar situation regarding territoriality might arise when two teams share the same stadium. Although most teams in Western Europe have their own stadium, a notable exception is the San Siro in Milan, which is shared by two of Europe's most successful teams, AC Milan and Inter Milan. AC Milan have the second lowest

home advantage in Italy, with Inter Milan also well below average (Table IV). The combined adjusted home advantage of the two teams is 63.1%, significantly lower than for the rest of Italy ($P < 0.001$) and a possible consequence of a diminished sense of territoriality felt both by fans and the players when they are inside a stadium that they cannot claim as their own. This is consistent with the finding that home advantage is reduced in the first season after a team moves to a new stadium (Pollard, 2002), a situation that Neave and Wolfson (2004) suggest might be due to a feeling of ownership not being established and hence no developed sense of territorial protection.

Since most of the regions under investigation were offshore island communities, the effects of travel need also to be considered as a possible alternative explanation for the higher home advantage found. Previous studies have provided weak evidence that home advantage in football within a single country might be related to distance travelled. The countries involved were England (Clarke & Norman, 1995), Brazil (Pollard et al., 2008), and Turkey (Seckin & Pollard, 2008). For the four countries in South-West Europe, it should first be noted that home advantage for teams in the two most remote island groups (the Madeira and Canary Islands) was not significantly different from the rest of their respective countries. If a travel effect were present, then it should have been greatest for these islands. Since travel has become increasingly faster and more comfortable, home advantage would be expected to decline over time for all the island communities if travel was having an effect, and to be most evident in the early years of the league. However, no relationship was evident after correlating annual home advantage and time for each of the islands under study (all $P > 0.50$). Corsica and Sicily were the two islands with the greatest home advantage with respect to the rest of their respective countries. Sicily is no further from Rome than Milan, while teams in southern France are closer to Corsica than they are to Paris and the north. In general, travel to these islands should not be more difficult or tiring than to other parts of mainland Italy or France. The lack of evidence for a travel factor in any of the communities considered suggests that other factors were more likely causes of the high home advantage, with territoriality an explanation that would be consistent with all the team and regional variations found.

Conclusion

There has been considerable variation in the magnitude of home advantage since the start of the national professional football leagues in France, Italy, Portugal, and Spain around 1930. This applies over time, and to a lesser extent between the countries and between teams within countries. The most prominent feature over time is the decline that has taken place in all countries since the late 1970s and which has continued to the present. There are many possible reasons for this and their combined effect is likely to have produced the observed decline. These hypothesized causes mostly relate to changes that have been introduced to the rules and structure of the sport since the 1980s, coupled with the rapid commercialization of football that has taken place since the early 1990s and the ease with which players can now move internationally between teams. In addition, numerous minor rule changes have encouraged a more positive approach from away teams and have also led to an increase in "information transfer", the extent to which players and coaches communicate during a game. At the same time, players performing away from home, as well as referees, should now be better trained to disregard the partisan sounds from a home crowd and thus lessen the impact on home advantage.

Increased home advantage was seen in teams from the islands of Corsica and Sicily, locations that are both isolated and ethnically distinct from the rest of their respective countries. A greater sense of protection of home territory is a likely explanation. In contrast, home advantage was generally low in the capital cities where a feeling of territoriality is diluted by the continual presence of visitors from other cities and countries, as well as the existence of several teams from each capital competing for local identity. A diminished sense of territoriality could also explain the reduced home advantage for the two teams that share the same stadium in Milan.

Home advantage cannot continue to fall at its present rate. If it did there would soon be a disadvantage in playing at home. Careful monitoring of the phenomenon over the next few years should help to identify when the decline starts to level off, and to what extent other countries are experiencing a similar pattern of change.

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