

Original Article

Competitive balance in male and female leagues: approximation to the Spanish case

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Abstract:

The fans are the biggest part of the success of sports contests. The competitive equilibrium reflects uncertainty about the outcomes of professional sporting, which attracts the fans' interest. Thus, the competitive balance (CB) is one of the main issues in sports economics. The objective of this paper is to analyse and compare the CB of male (Liga Santander) and female (Liga Iberdrola) top division leagues of Spanish football. In particular, we consider two aspects of CB: the level of concentration and the level of dominance of a sample composed of six seasons (from 2012/13 to 2017/18). For the concentration analysis, the Herfindahl-Hirschman Index (HHI), the ideal HHI competitive balance and deviated HHI (dHHI) are calculated. To analyse the dominance level, the HHI of dominance (HHID) in terms of titles won and top 4 are calculated. The results indicate that Liga Santander (male) is more balanced than the Liga Iberdrola (female). However, these findings do not imply that Liga Santander is balanced. In relation to dominance in terms of titles won, Liga Iberdrola is much better than Liga Santander. However, in terms of the top 4 dominance, both leagues have presented the same results. In this sense, both leagues' decision makers must act to improve the competitive balance. In spite of the recent increase of media and attendance in the Liga Iberdrola, the lack of CB could be a serious handicap to it becoming a professional league.

Key words: uncertainty outcome, football, women, men, sports, Spain.

Introduction

The competitive balance (CB) measurement is pivotal in the literature, since measuring CB appropriately is central to the economic analysis of sports leagues (Lee, Kim, & Kim, 2018). The uncertainty of outcome (UO) has been discussed in the literature since Rottenberg (1956) and Neale's (1964) seminal works. Fort and Maxcy (2003) categorise the theoretical and empirical literature on CB in two terms. On the one hand, the analysis of CB, in which the main issue is the behaviour of CB over time and the changes in business practice and competition policies. On the other hand, the second approach considers the CB literature that analyses the effect of the uncertainty of outcome hypothesis on fans interest, attendance, and audience.

The main product of the football industry is the leagues or the championships, while the consumers are the fans who buy stadium attendance, broadcasts, and merchandising products. Competitive balance (CB) is thought to be an important determinant of demand for sporting events. The competitive equilibrium reflects uncertainty about the outcomes of professional sporting events (Humphreys, 2002). In recent years, the UEFA (Union of European Football Associations – the European governing body of football) have stressed that CB is the most important challenge of European football over the next few years (Ramchandani, Plumley, Boyes, & Wilson, 2018). Because of this, the study of the CB for the football leagues is relevant because a greater balance results in greater fans' interest, which leads to better attendance and more television audience (Dobson & Goddard, 2001; Forrest & Simmons, 2002).

Despite the relevance of CB in sports economics theoretical literature, its importance on empirical evidence is ambiguous. Buraimo and Simmons (2008) have found clear evidence that an increase in uncertainty of outcome is associated with reduced gate attendance in the English Premier League. During the six seasons analysed, their results suggest that home fans prefer to see their team win rather than watch a draw or see the home team defeated. Pawlowski (2013) have analysed subjective perceived CB and its relevance based on a fan survey conducted in German *Bundesliga*. His findings reveal that around 70% of fans care about CB in the German *Bundesliga*, but at present it appears to be balanced enough for fans. Buraimo and Simmons (2015) conclude that star quality was an important determinant of television audiences for the English Premier League over the 2000/01–2007/08 period, whereas UO, championship dispute, qualifying for continental leagues, as well as relegation contention, were not. His findings are not suitable to detect the relevance of the UO hypothesis in European professional football.

Commonly, the CB literature (Zimbalist, 2002; Evans, 2014) distinguishes the CB measures through two aspects: the level of concentration and the level of dominance. Evans (2014) points out that the essential difference is whether the identity of the team matters to the measure. In the case of concentration measures, the identity of clubs does not matter; however, it matters in the case of dominance measures. In addition, the competitiveness of sports leagues may be evaluated in three temporal dimensions: short-term (match by match), medium-term (competitiveness within a certain season), and long-term (related to the domain of the clubs between seasons).

Various measures have been developed to address CB (see Evans, 2014, for extensive review of the main measures of CB). Owen, Ryan, & Weatherston (2007) were one of the first researchers to apply HHI to measure CB in professional sports leagues. Following Owen's et al. (2007) approach, several papers (Pawlowski, Breuer, & Hovemann, 2010; Unanue, Villarrubia, Guerrero, Godoy, & Sánchez, 2014; Gasparetto & Barajas, 2016; Ramchandani et al., 2018) have used HHI to measure within-season CB. The HHI is an industry standard and well-known measure, and its adapted versions allow comparisons between leagues with a different number of teams and within leagues when the number of teams changes over time. Following this majority approach, we have employed HHI to analyse the CB of Spanish football top leagues. Other papers have used or proposed new and different measures. Humphreys (2002) has proposed the Competitive Balance Ratio (CBR), which reflects team-specific variation in winning percentage over time and league-specific variation. In football, Scelles, Durand, Bonnal, Goyeau, and Andreff (2013) have analysed the competitive intensity, employing dummies that are a function of the points difference for the home team before a match in relation to ranks with sporting stakes to investigate the determinants of attendance of French league matches. Gasparetto and Barajas (2016) have proposed an Accumulated Points Difference (APD) and they compare this measure with other well-known measures in the general industry. Mon-Friera and Rodríguez-Guerrero (2016) have used the Gini index, Pearson coefficient, concentration ratios, and HHI to analyse the competitive balance of the men's Spanish league since its inception.

Also, Scelles et al. (2013) and Kringstad and Gerrard (2004) point out that besides the degree of equity between team playing strengths, namely besides the CB, audiences are also interested in league ranks, which enable teams to play in European competitions and determine their relegation to a lower level division. Rodríguez (2012) has adapted this definition to the reality of European football, measuring the competitive balance through the possibility of all clubs to qualify for the UEFA Champions League. In this sense and to better understand the CB in terms of dominance of Spanish's top leagues, we also have employed an adapted HHI of dominance (HHI^D). In addition, male top leagues are deeply analysed and exist within a consistent framework to discuss new or different findings; in female football, the lack of information is an important issue. While women's football advances, develops, and has significant increases on its media impact, in other fundamental aspects it is still very archaic. An example of such growth is the project implemented by the UEFA Women's Football Development Program (WFDP) in which women's football is mapped across Europe, knowing the growth in the number of federated players, the qualification of coaches, and coaches, as well as other diverse aspects that contribute to knowing what the main shortages and factors to be improved are. In this regard, the sample analysed is composed of the last six seasons (from 2012/13 to 2017/18) of male and female leagues of the Spanish first division of football.

As far as we know, only Vales-Vázquez, Casal-López, Gómez-Rodríguez, & Blanco-Pita (2009) have observed the CB of a female football top league. Vales-Vázquez et al. (2017) have analysed the profile of six performance levels of Spanish football (Men's First, Second, Second B, Third and, Youth Honour Divisions, and the Women's First Division). Their results indicate that the second masculine one is the category with greater equality and that the first female division (*Liga Iberdrola*) presents the profile with a smaller competitive balance of the analysed divisions. The main limitation of this analysis of CB is closely related to the methodology employed. First, the indicator of CB employed was the size difference of the final scores. Second, despite that they observed the match uncertainty of outcome, they only considered a single season (2015/16).

Regarding the theoretical relevance of the CB of sports leagues, the increasing media impact of female football, and the lack of studies on this issue, we propose that the aim of this article is to analyse and compare the CB of male and female top division leagues of Spanish football. This paper is organised as follows. The following section describes material and methods. This is followed by the results of the analysis of CB concentration and dominance. Subsequently our results are discussed. Finally, we draw some conclusions from our analysis.

Material and methods

Sample and Data Collection

The sample is composed of the last six seasons (from 2012/13 to 2017/18) of male and female leagues of Spanish first division of football. We have considered under analysis only six seasons because in the female league was applied a new system of competition in season 2012/13. Due to the sponsorship agreements, the leagues are named *Liga Santander* (male) and *Liga Iberdrola* (female). The *Liga Santander* has 20 teams and the *Liga Iberdrola* 16. In both leagues, the competition system consists of a single group facing all against all in a double round (one match at home and another in an away field), according to a schedule previously established

by draw. The teams score based on their results: three points per match won, one for a draw, and none for losses. The club that scores the most points at the end of the championship is proclaimed league champion.

In *Liga Santander*, the team that scores the most points at the end of the championship will be proclaimed League champion and will obtain the automatic right to participate in the group stage of the next edition of the UEFA Champions League, together with the runners-up and the third-placed team; the fourth will dispute the previous round to access the group stage of said competition. The fifth-place finisher will get the right to participate in the play-off round of the next UEFA Europa League and the sixth in the third round of the same, if in the *Copa del Rey* (King's Cup) the champion is qualified for the Champions League, the seventh classified will obtain the right to play the third previous round of the next edition of the Europa League. In addition, the champion disputes the *Supercopa* (Super Cup) of Spain, facing the winner of the *Copa del Rey* of the same season. The last three teams will descend to the Second Division (*League BBVA*). The two first classified and the third winner of a qualifying system of the Second Division will replace the teams that descend.

In *Liga Iberdrola* the team that is proclaimed league champion gets a place for the next edition of the UEFA Women's Champions League, as well as the second place. Likewise, the top eight contenders play the *Copa de la Reina* (Queen's Cup) at the end of the league. The last two teams descend to the Female Second Division and two teams ascend to *Liga Iberdrola*.

The data were collected from a primary source database, which is the official *LaLiga* webpage and the secondary source database is a specialised webpage of historical statistics *Ceroacero* and the *Royal Federation of Spanish Football*. Table 1 sums up the descriptive statistics of the points achieved in league during the six seasons analysed. As can be observed, the average of points spread by season in each league is stable. However, values of standard deviation, maximum and minimum of points, which could be simple indicators of the CB (concentration) of leagues, show interesting differences. The cases of *Liga Iberdrola* in season 2012/13 (SD= 21) and 2015/16 (SD=20.9), and *Liga Santander* 2014/15 (SD= 20.8) are the most remarkable in terms of variation of points, which are spread out over a wider range. This simple observation could indicate a low competitive balance, which is analysed in more detail and through more specific measures below.

Table 1. Descriptive statistics (points in league)

	2012/13		2013/14		2014/15		2015/16		2016/17		2017/18	
	LS	LI	LS	LI	LS	LI	LS	LI	LS	LI	LS	LI
Average	52.8	42.5	52.7	41.6	52.5	41.6	52.4	42.4	52.6	42.2	52.7	42.1
SD	17.7	21.0	18.3	16.2	20.8	18.7	18.1	20.9	20.6	19.7	18.2	16.9
Maximum	100	76	90	77	94	77	91	78	93	78	93	77
Minimum	34	1	25	22	20	15	32	10	20	15	20	19

Note: LS= *Liga Santander* (Male); LI= *Liga Iberdrola* (Female); SD= Standard Deviation

In Table 2, for a first analysis of the leagues dominance, we observe a similar behaviour in both leagues. During the six seasons analysed, in the top positions both leagues have three different champions: Barcelona (4), Atlético de Madrid (1), and Real Madrid (1) in *Liga Santander*; and Barcelona (3); Atlético de Madrid (2), and Athletic (1) in *Liga Iberdrola*. In the bottom positions, those of relegation in Spanish leagues (three in *Liga Santander* and two in *Liga Iberdrola*) the presence of the teams is similar. In both leagues, no team was relegated and promoted again during the period analysed; namely, no team repeated their presence in bottom positions. In addition, among the relegated, three different teams in both leagues were promoted and relegated in the same season.

Table 2. Top and bottom positions of Spanish male (*Liga Santander*) and female (*Liga Iberdrola*) leagues

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
<i>Liga Santander</i>						
1rst	Barcelona	Atlético Madrid	Barcelona	Barcelona	Real Madrid	Barcelona
2nd	Real Madrid	Barcelona	Real Madrid	Real Madrid	Barcelona	Atlético Madrid
3rd	Atlético Madrid	Real Madrid	Atlético Madrid	Atlético Madrid	Atlético Madrid	Real Madrid
18th	Mallorca	Osasuna	Eibar/Elche*	Rayo Vallecano	Sporting Gijón	Deportivo
19th	Deportivo	Valladolid	Almería	Getafe	Osasuna	Las Palmas
20th	Zaragoza	Real Betis	Córdoba	Levante	Granada	Málaga
<i>Liga Iberdrola</i>						
1rst	Barcelona	Barcelona	Barcelona	Athletic	Atlético Madrid	Atlético Madrid
2nd	Athletic	Athletic	Atlético Madrid	Barcelona	Barcelona	Barcelona
3rd	Atlético Madrid	Atlético Madrid	Athletic	Atlético Madrid	Valencia	Athletic
15th	SPC Llanos Olivenza	Granada	CE Sant Gabriel	Oviedo Moderno	Oiartzun KE	Zaragoza CFF
16th	SD Lagunak	Levante Las Planas	Sevilla	UD Collerense	UD Tacuense	Santa Teresa CD

Note: P= points; Boldface font= teams promoted and relegated in the same season; *Elche was administratively relegated to the Second Division for breach of economic-financial requirements demanded by the Professional League of Football. His vacancy for the next season was occupied by Eibar, who finished the season in eighteenth position.

Procedure/ Methodology

Measure of Concentration

The HHI is used to measure the concentration of market share between different companies in a sector, or as could be in our case, teams in a league. Specifically, it will measure the concentration of the result reflected in the points achieved, with respect to the total points that occur in the season among all the teams participating in the competition. The HHI is calculated as follows:

$$\sum_{i=1}^n \frac{s_i^2}{s^2} \tag{1}$$

Where:

s = Total points spreads in league.

s_i = Number of points accumulated by the team i .

The index applied to football could show a minimum of $1/n$ and higher HHI means worst competitive equilibrium of the league analysed. If all the teams have the same number of points, the league has a perfect CB. In order to compare the CB from different leagues with different number of teams, we also have calculated the dHHI (deviated Herfindahl-Hirschman Index). The dHHI is calculated as follows:

$$dHHI = HHI - (1/n) \tag{2}$$

Again, an increase in index represents a decrease in CB.

Measure of Dominance

An adapted HHI used to analyse concentration in an industry is proposed to measure the CB of sports leagues in terms of dominance of teams over a number of seasons. It is called HHI^D , and the general form given by:

$$HHI^D = \sum_{i=1}^N x_i^2 \tag{3}$$

As Evans (2014) has mentioned, this adapted measure can be used to analyse the dominance in terms of titles won (Humphreys, 2002) and in terms of number of top positions (Eckard, 2001). In both cases N is the number of teams (i) in the league. In the case of the analysis of the titles won, x_i is the share of titles won by team i over a selected number of seasons. An increase in the number of title winners means a decrease in the value given by this measure. The minimum value is the inverse of the number of studied seasons, corresponds to perfect CB each team would win the title, on average, every N seasons. The maximum value, one, would occur if the same team wins the title every season.

In the case of the number of top positions, x_i is the share of appearances in top (or bottom) four positions by team i over a selected number of seasons. An increase in the ranking, if everything remains the same ('ceteris paribus'), reduces the value given by this measure. The measure has a minimum value of $(1/\square)$, which corresponds to perfect CB where each team would appear in a list, on average, every $(\square/4)$ seasons. The maximum value $(1/4)$ would occur if the same teams appear on the list every season. The limits for this measure are the same as for the top four measures (Evans, 2014).

Results

Results of Concentration

Figure 1 exposes the results of comparing the HHI and the ideal CB index for a league (considering the number of n clubs of each league). As can be observed in all six seasons analysed, the CB of *Liga Santander* is closer to the ideal when compared to the indexes of *Liga Iberdrola*. In analysing Figure 1 we also show the most random behaviour of CB in *Liga Iberdrola*, when compared to *Liga Santander*.

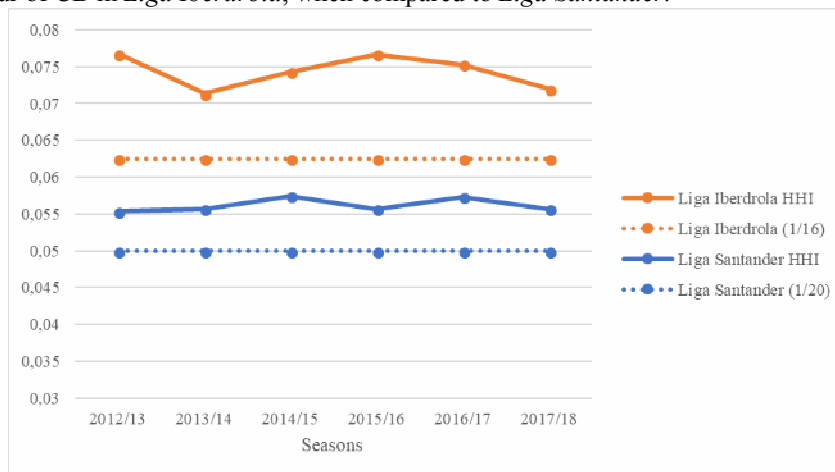


Fig. 1. Competitive balance of Spanish football first divisions

The results presented in Figure 2 show the importance of the use of the deviated HHI (dHHI), which normalises the HHI, considering the number of teams in the league. First, we can observe that even when employing the dHHI, the differences between both leagues persist. Second, the CB of *Liga Iberdrola* still is higher than the *Liga Santander* during all the seasons analysed. Third, in some seasons (2013/14 and 2017/18), we have found the lowest differences (0.0031 and 0.0037, respectively) between the dHHI. Taking into account the whole studied period, the average test shows a significative difference.

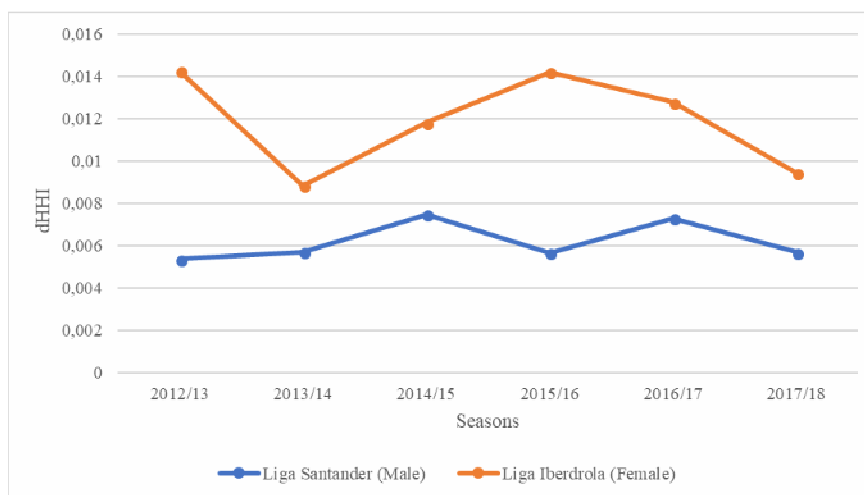


Fig.2. Competitive balance of Spanish football first divisions (dHHI)

Results of Dominance

The result of the CB analysis of dominance (HHI^D) in terms of titles won is an index of 0.50 for the *Liga Santander* and 0.38 for *Liga Iberdrola*. As Evans (2014) points out, an increase in the number of title winners means a decrease in this indicator, so the lower HHI^D the better CB dominance a league has, which indicates that *Liga Iberdrola* shows a better CB of dominance in terms of titles won than *Liga Santander*. The result of the CB of dominance in terms of the top 4 is an index of 0.80 for the *Liga Santander* and for *Liga Iberdrola*. These results indicate that *Liga Santander* and *Liga Iberdrola* have the same CB in terms of dominance for the top 4.

Discussion

Regarding the theoretical relevance of the sports leagues' CB, the increasing media impact of female football and, the lack of studies on this issue, we have analysed and compared the CB of concentration and dominance in male and female top leagues of Spanish football. The results of CB in terms of concentration indicate low CB in both leagues. In the case of the male league, this result is confirmed by previous empirical evidence (Gasparetto & Barajas, 2016; Mon-Friera & Rodriguez-Guerrero, 2016; Ramchandani et al., 2018).

However, the most important result of this research is that during all the seasons analysed, the CB in terms of concentration of *Liga Iberdrola* is lower than *Liga Santander*. In this regard, our results corroborate those found by Vales-Vázquez et al. (2017). However, our results are more robust since they consider more seasons and we also use the CB measurement that is widely used in the literature.

Analysing the CB of dominance, we have observed that both leagues are almost fully dominated by the same teams. In *Liga Santander* the same three teams have occupied the top three positions during the six seasons under analysis (Barcelona, Real Madrid, and Atlético de Madrid). In *Liga Iberdrola*, three team performances are also highlighted (Barcelona, Atlético de Madrid, and Athletic); the only exception is the appearance of Valencia in season 2016/17 in the third position. As we have mentioned before, in a league amateur/semi-professional such as *Liga Iberdrola*, is important to remark on the identity of the three teams that dominate the last six seasons. Barcelona, Atlético de Madrid, and Athletic are three clubs with the best historical participation and performance on *Liga Santander*. Most likely, the female sections of these big/medium clubs of the Spanish football are benefitted by the infrastructure and staff of the male professional section. This phenomenon could be called "drag effect".

Regarding our results of CB in terms of dominance related to the top 4 teams, we have found that both leagues presented same indexes. The results indicate a high level of dominance of the top 4 teams in *Liga Santander* and *Liga Iberdrola*, which repeats almost every year in the top 4 positions. These results mean that there is a very low competitive balance and highlights that there is a clear group of teams dominating both leagues.

Késenne (2000) have remarked that CB depends on the distribution of player talent among clubs. Sanderson also points out several factors that indirectly impact the CB of sports leagues. We believe that the low

CB in *Liga Iberdrola* is caused by the concentration of resources and players in certain teams that take advantage of the resources and synergies of their male teams. In addition, the fact that it generates less income means that the base teams may receive less support, and the few talented players are focused in the teams that can best afford them, which are the greats of the male league.

Our main recommendations are in the same vein of Buraimo and Simmons (2015) and Pawlowski's (2013) findings; in general, league managers should consider measures that ensure a certain degree of CB in the league. However, there is no urgent need to arbitrarily implement measures to equalise the distribution of player talents between the clubs of *Liga Santander*. Nevertheless, the governing body of *Liga Iberdrola* must pay more attention on its competitive balance, to keep on rising. In order to do that, if we assume that the concentration of talent is generated by the strength of big clubs with male professional section and its "drag effect", we recommend considering these questions at the time of assigning the budget distribution. Small teams with less infrastructure and fewer and lower qualified staff need to receive better quotas. The same must occur with base teams of small clubs; and finally, a clause of formation must be included in players' transfers. Nevertheless, this study has the limitation of being only focused in one country. In order to generalise our findings, it would be necessary to consider male and female leagues in other countries with a great tradition in football.

Conclusions

We have analysed the degree of CB in the male and female football leagues in Spain from season 2012/13 to 2017/18. As far as we know, this is the first time that a comparison has been made between male and female sports leagues. No previous studies have considered this comparison for a wide set of seasons to obtain robust results. Our results show a low CB in both leagues. The comparison highlights that the CB in terms of concentration of *Liga Iberdrola* is lower than *Liga Santander*. Also, in analysing the CB of dominance, we have observed that both leagues are almost fully dominated by the same teams. Some recommendations are suggested to improve the CB for the Spanish female football league.

Conflicts of interest – There is no conflicts of interest to declare.

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