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On the control of competitive balance in the major European football leagues

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Abstract

Authorities in the economic field (European Commission and US Federal Trade Commission) focus on the level of market concentration and establish limits in order to promote competition. However, sports authorities do not seem to pay the same attention to competitive balance in the national leagues, given the results achieved in the major leagues and limited interventions and regulations in this area. How are the major European football leagues evaluated based on the limits set for market concentration in the United States or the European Union? Following this line, we undertook a comparative analysis using the distance to competitive balance index, whose range is the unit interval, and define it as a function in a metric space. The comparative analysis shows, as in other studies, the high and ever-growing concentration of the results of these leagues over the past 25 years. With the European Commission and US Federal Trade Commission criteria, about one in three seasons would have been highly concentrated in the period analysed, and half in the last 10 seasons. Thus, it would seem reasonable that mechanisms that encourage competitiveness are considered.

1 | INTRODUCTION

There are similarities between the concepts of concentration in industrial economics and competitive balance in sports economics. Insofar as concentration means ‘control by the few’ (Hirschman, 1945), the defence of competition in the markets is a reality; nevertheless, this does not happen in sports competitions. Rocaboy (2017) argues that interest in ensuring teams participate at an international level can negatively affect competitiveness in national leagues, which raises the possibility of introducing regulations.

Industrial concentration is characteristic market variable that reflects the extent to which market activity is controlled by larger companies (Scherer, 1980). Hence, it has been linked to market power and the distance a certain market must have to reach a situation of perfect competition (Tirole, 1988).

In this regard, concentration has been used as a variable in modelling related to the *structure–performance–results paradigm* in industrial economics (Koch, 1980). Moreover, this issue has sparked some important debates. For example, whether the differences in the effectiveness with which sectors limit competition can explain the differences in the results companies achieve (*hypothesis of differential collusion*), thus allowing a relationship to be drawn between concentration and market power (Cowling & Waterson, 1976) or profits (Cowling, 1982), or whether more efficient companies obtain a greater share of the market since they can lower prices more than their less efficient competitors (Demsetz, 1973; Peltzman, 1977) (*hypothesis of differential efficiency*).

State intervention might be appropriate in the first situation but not the second since restrictions and penalties would be imposed on the most efficient firms. Thus, concentration has implications in terms

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of the economic policies (particularly against monopolistic practices) of those authorities competent in issues regarding defence of competition.

Competitive balance is a basic concept in sports economics (Szymanski, 2003), which indicates the degree of control participating teams have over a sports competition, depending on their sporting quality (Kringstad & Gerrard, 2004). At the end of the competition, the focus is on the distribution of results achieved. If a small number of teams achieve favourable results, there will be reduced competitive balance.

Therefore, the relationship with the concept of concentration is inverse: Greater control of results by few teams means less competitive balance, and on the contrary, if all teams participating in a competition obtain the same result, competitive balance peaks.

Since there are official bodies working to defend competitiveness and acting according to the concentration levels reached in the markets, so that large companies do not jeopardise competition or consumers, it could be argued that sports authorities might act in a similar way to promote competition in leagues and benefit consumers (fans, spectators, gamblers, etc.).

In this sense, economic authorities seek to defend competition 'a priori' or 'ex ante' with regulations that prevent contrary practices and encourage competition. However, in addition, economic authorities take decisions 'a posteriori' or 'ex post' if it is shown that such regulations have not had the intended effect and, in the end, high levels of concentration in the markets have occurred.

Do sports authorities carry out similar monitoring and make decisions to the same extent as economic competition authorities? If they do not, is it necessary for economic authorities to intervene in the sports field? Undoubtedly, the Financial Fair Play rule can contribute to improving the levels of competitive balance, despite its limitations and critics. However, greater improvements might be achieved if Union of European Football Associations (UEFA) and sports federations themselves took steps to address persistent increases in concentration or high levels of concentration.

What has been the evolution of the competitive balance in the major European football leagues, and can we compare the levels achieved with the limits set by the economic authorities (European Commission [EC] and US Federal Trade Commission [FTC]) for goods and services markets? Overall, it seems to be a stylised fact that, in recent years, the competitive balance of the major national football competitions has decreased while, at the same time, the competitive balance has been reduced.

Using the standardised Herfindahl–Hirschman index (HHI) (Owen et al., 2007), Triguero-Ruiz and Avila-Cano (2018, 2019) present a practical example for the major European soccer leagues from 1997/1998 to 2016/2017. Except for the Italian league, they find a decrease in the levels of competitive balance in the major European soccer leagues. The Italian and English leagues have the highest degree of concentration, and the French league has the lowest. The Spanish and German leagues have intermediate levels but with different trends.

This high and increasing growth in the concentration of results, that is, a decrease in the competitive balance, has also been reported by Michie and Oughton (2004), Garcia Villar and Guerrero Rodriguez (2007), Owen et al. (2007) and Pawlowski et al. (2010).

Michie and Oughton (2004) show a decline in competitive balance experienced in the English Premier League in the second half of the last century. Similar trends in competitive balance can be seen in the first-division leagues in Italy and Germany. In France, there is no clear trend over that period, though there are signs of increasing rates from 1992 onwards. Spain has experienced a more cyclical pattern. Garcia Villar and Guerrero Rodriguez (2007) find a significant deterioration of the competitive balance in Spanish football in the first decade of this century.

Based on several competitive balance measures, Pawlowski et al. (2010) reveal a significant decrease in competitive balance in the major European leagues after the modification of the UEFA Champions League (UCL) pay-out system (1999/2000).

Plumley et al. (2019) show a statistically significant decline in competitive balance after the inception of Financial Fair Play regulations by UEFA in 2011, particularly for leagues in Spain, Germany and France but not for England and Italy.

On the other hand, it is true that competitive balance is not a static phenomenon. Competitive balance encompasses the persistence of performance between seasons. In our study, we focused on the first approach (win dispersion). As is well known, only a few teams are consistently ranked top in the main European leagues. From the 1997 to 1998 seasons, only one non-Big Five team (F.C. Porto) competed in the UCL final. The two teams with the most victories in each of these leagues from these seasons garnered two of the three finalist places of the UCL and won four of five finals (Manchester United and Chelsea, Barcelona and Real Madrid, Juventus and Internazionale, Bayern Munich and Borussia Dortmund, and Olympique Lyonnais and Paris Saint-Germain). The sporting strength of these teams is reflected in their performance's national championships. The two strongest teams have won their countries' own league most seasons. In France, they have won more than half the leagues in these seasons. Elsewhere, they have won between 70% (UK) and 80% (Spain, Germany and Italy) of their leagues. In France, in the last 25 years, there have been nine winning teams in Ligue 1. In Germany, there have been six winning teams and five winning teams in Spain, Italy and the UK.

In our case, the interest lies in also comparing the levels of competitive balance with the levels of concentration required in other industrial and service markets, where attempts have been made by national and supranational economic authorities to preserve and promote competition. Clearly, these are worlds apart, but they certainly provide a useful benchmark for the level of concentration of outcomes achieved.

The article has been developed as follows. In Section 2, we replicate the limits on concentration levels set by economic authorities; for this, we use a competitive balance index based on mathematical distance. In Section 3, this is applied to the major European football leagues. Finally, we present the conclusions.

2 | LIMITS ON CONCENTRATION AND COMPETITIVE IMBALANCE

From a normative approach (Blackorby et al., 1982), the economic policy evaluators' preferences with regard to the degree of concentration could be similar to those of sports authorities regarding competitive balance. These would be represented by a concave utility function, indicating that market configurations or competition results where participants had similar importance would be preferred to those where a few clearly predominate over rivals, hence the role of government agencies to defend competition or of bodies to ensure equal opportunities in sports competitions.

However, it is easy to see that economic authorities have a greater capacity to influence markets than sports authorities in competitions.

As Western economies encouraged the market economy as a mechanism for allocating resources, the defence of competition was established in state legislation. In the United States, the Sherman Act (1890) was the first antitrust statute, which was completed and reinforced by the Clayton Act (amended by the Robinson-Patman Act in 1936) and the FTC Act, both drawn up in 1914. In the United States, there are two government agencies charged with applying this legislation: the Antitrust Division of the Department of Justice and the FTC. Since 1968, the *Merger Guidelines* (modified in 1982, 1984, 1992, 1997 and 2010) have used the measurements of concentration indexes in order to set limits based on the index values (FTC, 2010).

Moreover, competition policy is one of the foundations of the current European Union (EU). The Treaty of Paris (1951), which established the European Coal and Steel Community, was a pioneer in applying a transnational competition policy, as well as being a predecessor to the Treaty of Rome (1957), which created the European Economic Community and whose Articles 85 to 94 contain the issues related to this area. The European Commissioner for Competition and the EC's (2004) Directorate-General for Competition are responsible for compliance with the regulations, which, since 1989, includes regulating mergers and impeding those that involve exceeding certain concentration limits as well as discerning whether a dominant position is created or reinforced.

Monitoring of the markets and, in addition, the regional or national economic authorities of EU member states is unmatched in the sports authorities' ambit, especially regarding football.

It is true that clubs are subject to public scrutiny, including economic ones like tax payments, regarding the control of the signing up and remuneration of players. In addition, measures adopted by the UEFA (2018), such as Financial Fair Play, constitute a good mechanism to promote competition. However, the sports authorities do not seem to pay much attention to the degree of concentration reached in championships. The interventions that have been implemented or proposed by some major North American leagues could prove useful in European football. These include salary caps, revenue sharing (sharing of gate and broadcast revenues) and restrictions on player movement, salaries, reserve clauses or drafts. Some of these mechanisms are already in place but require stronger oversight to ensure appropriate

implementation. Others should be evaluated for possible implementation (Kesenne, 2019).

In the 1994–1995 season, an important decision was made in football when the UEFA, together with several national federations, adopted the three points for a win scoring system (the Football League in England was first to introduce the 3 points per win in 1981). Moreover, the change to the scoring system introduced by World Rugby to incorporate remunerations for bonuses in this sport was highly significant, especially since the Six Nations Championship in the 2016–2017 season. Both mechanisms may foster greater competition and may encourage competitive balance. Although changes in the scoring system affect statistical measurements of competitive balance, the effect that these changes have on competitive balance remains to be clarified.

The FTC and the EC use the HHI to rate the eligibility of market concentration levels. A 'deconcentrated' sector (with an HHI of less than 0.15 and 0.10 for the FTC and EC, respectively) will not be the object of attention before processes, like those of a merger. However, a 'highly concentrated' market (with an HHI greater than 0.25 for the FTC or greater than 0.20 with an increase greater than 0.015 or between 0.10 and 0.20 with an increase greater than 0.025 for the EC) will probably be the object of an analysis.

Does it make sense to replicate these limits from the perspective of football? The bilaterality of confrontations and the limited number of teams in competitions reduce the range for the HHI, which has led to the use of its normalisation: $HHI_N = HHI - HHI_{\min} / HHI_{\max} - HHI_{\min}$ (Owen et al., 2007), where HHI_{\min} and HHI_{\max} are the minimum and maximum values of HHI, respectively.

For their part, Triguero-Ruiz and Avila-Cano (2019) define a new index called distance to competitive balance (DCB), interpretable as the concentration percentage with respect to the maximum achievable. This index constitutes a metric, so it maintains the scale in a way that the ratio between two values of the index has significance, as does the difference (percentage points). The DCB index is constructed as a mathematical distance and complies with the cardinality property. This index allows comparisons to be made among leagues and over time. If we focus on the concentration of results within each league in each season, we believe that the DCB index is a good option for measuring competitive balance. Note that it is a monotonic increasing transformation of the normalised HHI. As such, it orders analogously while allowing us to enjoy the properties of a mathematical distance.

Gerrard and Kringstad (2021) suggest that the different measures of competitive balance can be simplified using a two-dimensional categorisation of win dispersion measures (e.g., the DCB index) and performance–persistence measures (e.g., the Spearman rank correlation coefficient; Maxcy, 2002). Furthermore, 'win dispersion and performance persistence are not necessarily strongly related and may not always move in the same direction' (Gerrard & Kringstad, 2021). Our analysis has not focused on the win–loss records of teams across seasons. In our case, the point of view we are interested in highlighting is that of 'win dispersion'. Precisely, the analysis we make is linked to markets and economic sectors, where what is relevant would be the share that firms achieve after the process of competition between

them (equivalent to the shares of points of the teams in the final ranking of the league, here understood as a ‘market’ or ‘sector’).

The DCB index is defined in the space X^{n-1} , a subspace of the simplex $n - 1$ dimension, of league configurations \mathbf{s} , that is, vectors of the teams’ points: $\mathbf{s} = (s_1, \dots, s_n)$ in leagues with a maximum of n teams, where $s_i \in [0, 1]$ and $\sum_{i=1}^n s_i = 1$. For each \mathbf{s} , the DCB is constructed as the ratio between the Euclidean distance at the minimum concentration (equal points) and the maximum distance that can be reached. The latter is represented by a configuration, s_i^{\max} , which can be obtained from n and the current scoring system in the championship (Avila-Cano et al., 2021), given that the bilateral nature of the confrontations prevents a monopoly configuration. In this way, we have

$$DCB(\mathbf{s}) = \frac{\sqrt{n \cdot \sum_{i=1}^n s_i^2 - 1}}{\sqrt{n \cdot \sum_{i=1}^n (s_i^{\max})^2 - 1}} \tag{1}$$

TABLE 1 Characteristics of leagues consisting of 20 teams according to the DCB. Values for leagues consisting of 18 teams are in brackets.

	Federal Trade Commission criteria	European Commission criteria
Deconcentrated	<0.324 (0.316)	<0.229 (0.217)
Moderately concentrated	Between 0.324 (0.316) and 0.459 (0.454)	0.229 (0.217)–0.397 (0.391) (and $\Delta DCB < 0.025$) >0.397 (0.391) (and $\Delta DCB < 0.015$)
Very concentrated	>0.459 (0.454)	0.229 (0.217)–0.397 (0.391) (and $\Delta DCB > 0.025$) >0.397 (0.391) (and $\Delta DCB > 0.015$)

Abbreviation: DCB, distance to competitive balance.

TABLE 2 Descriptive statistics of the DCB indices (1997/1998–2021/2022)

	Premier League (England)	Primera División (Spain)	Ligue 1 (France)	Bundesliga (Germany)	Serie A (Italy)	Mean
Mean	0.444	0.404	0.369	0.407	0.453	0.416
Standard error	0.011	0.015	0.012	0.011	0.011	0.012
Median	0.454	0.388	0.383	0.410	0.451	0.417
Standard deviation	0.056	0.074	0.059	0.054	0.053	0.059
Sample variance	0.003	0.005	0.003	0.003	0.003	0.004
Kurtosis	−0.476	−0.624	−0.489	0.334	−0.987	−0.448
Skewness	−0.408	0.150	−0.460	−0.593	0.151	−0.232
Range	0.212	0.279	0.225	0.210	0.178	0.221
Minimum	0.325	0.270	0.236	0.287	0.362	0.296
Maximum	0.537	0.549	0.461	0.498	0.540	0.517
Seasons	25	25	25	25	25	-

Abbreviation: DCB, distance to competitive balance.

It shows that $DCB(\mathbf{s}) = \sqrt{HHI_N}$.

In these conditions, we can redefine the aforementioned limits for the HHI in terms of limits for the DCB. For example, let us focus on the limit the US FTC considers a deconcentrated sector ($HHI < 0.15$). If the league has $n = 20$ teams, we know that $HHI_{\min} = 1/20 = 0.05$. So, $HHI_N = 0.1 - 0.05/1 - 0.05 = 0.0526$ and $DCB = 0.2294$. Similarly, to construct Table 1, we use the values 0.15, 0.20 and 0.25 for HHI.

From the maximum values, given n , HHI values that would generate a similar percentage of concentration or distance to the perfect competitive balance can be constructed.

3 | APPLICATION TO THE MAJOR EUROPEAN FOOTBALL LEAGUES

Our analysis focuses on the evolution of the competitive balance in the major European football leagues between the 1997/1998 and 2021/2022 seasons. These leagues are the Premier League (England), Primera División (Spain), Ligue 1 (France), Bundesliga (Germany) and Serie A (Italy).

3.1 | Data and descriptive analysis

Table 2 shows the descriptive statistics of the data, which refer to the final rankings of each league in each season. It should be taken into consideration that, in all the leagues, the matches are bilateral, in a double round-robin system and with a scoring pattern that rewards 3 points to the winner, rewards 0 point to the loser and, in the case of a tie, distributes 1 point to each team.

The average competitive balance of these 25 seasons in the five major leagues has been over 40%. The Serie A ($DCB = 45.3\%$) and Premier League ($DCB = 44.4\%$) have the lowest degree of competitive balance globally. Ligue 1 presents, on average, the highest

average level of competitive balance ($DCB = 36.9\%$). The Bundesliga and the Primera División have similar and intermediate levels ($DCB \approx 40.0\%$).

Both leagues, Premier and Serie A, also have the highest median values and, interestingly, the lowest dispersion, as measured by the standard deviation or range, along with the Bundesliga. Seasonal distributions of competitive balance show little concentration of data in the mean (kurtosis), except in the Bundesliga. The Serie A and the Primera División show positive data skewness. League 1 has the lowest value ($DCB = 23.6\%$ in 1999/2000), and Serie A the highest ($DCB = 54.0\%$ in 2020/2021).

Given these conditions, we can ask ourselves the following question: Is the level of competitive balance really reduced enough to merit attention? Table 3 shows that we can respond affirmatively to this question.

Table 3 shows the average levels of the DCB index for the five 5-year periods for the period analysed, and the five national leagues can be divided. Except for the 5-year period 2012/2017 in the Spanish League and the 5-year period 2007/2012 in the Italian League, in

all leagues, the average DCB value is higher than in the preceding 5-year period. Furthermore, in all leagues, the average DCB values in the 5-year periods 1997/2002 and 2002/2007 are lower than the average of the respective leagues.

Figures 1–5 show a visual description of the annual evolution of the DCB index values for each national league. These values are compared with the limits set by the economic authorities (EC and US FTC) for the goods and services markets (Table 1). These limits constitute a reference to identify excessive levels of concentration and, therefore, the need to control them.

Figures 1–5 show that, in any of the five leagues, none of the 25 seasons analysed can be called deconcentrated (this limit represents the lower straight line in the graphics, parallel to the abscissa). The observations on the upper straight line are candidates for very concentrated configurations, common in the Premier League since 2003/2004; in the Primera División since 2009/2010; and in Serie A, with some exceptions. The Bundesliga presents several cases, and Lige 1, with a tendency towards increasing concentration, exceeds the limits in the last seasons.

TABLE 3 DCB index averages in the major European football leagues 1997/1998–2021/2022

Leagues seasons	Premier League (England)	Primera División (Spain)	Ligue 1 (France)	Bundesliga (Germany)	Serie A (Italy)	Mean
1997/2002	0.385	0.316	0.319	0.362	0.426	0.362
2002/2007	0.430	0.357	0.322	0.383	0.457	0.390
2007/2012	0.454	0.420	0.366	0.400	0.400	0.408
2012/2017	0.464	0.498	0.405	0.444	0.476	0.458
2017/2022	0.489	0.429	0.432	0.448	0.504	0.461
Mean	0.444	0.404	0.369	0.407	0.457	0.416

Abbreviation: DCB, distance to competitive balance.

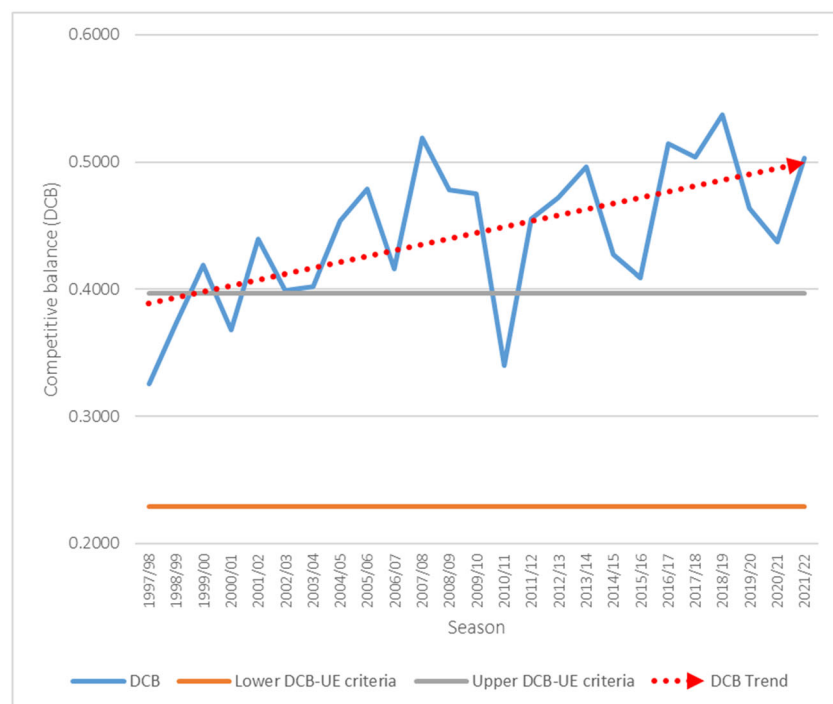


FIGURE 1 Evolution of distance to competitive balance (DCB) index. Premier League (England) [Color figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/terms-and-conditions)]

FIGURE 2 Evolution of distance to competitive balance (DCB) index. Primera División (Spain) [Color figure can be viewed at wileyonlinelibrary.com]

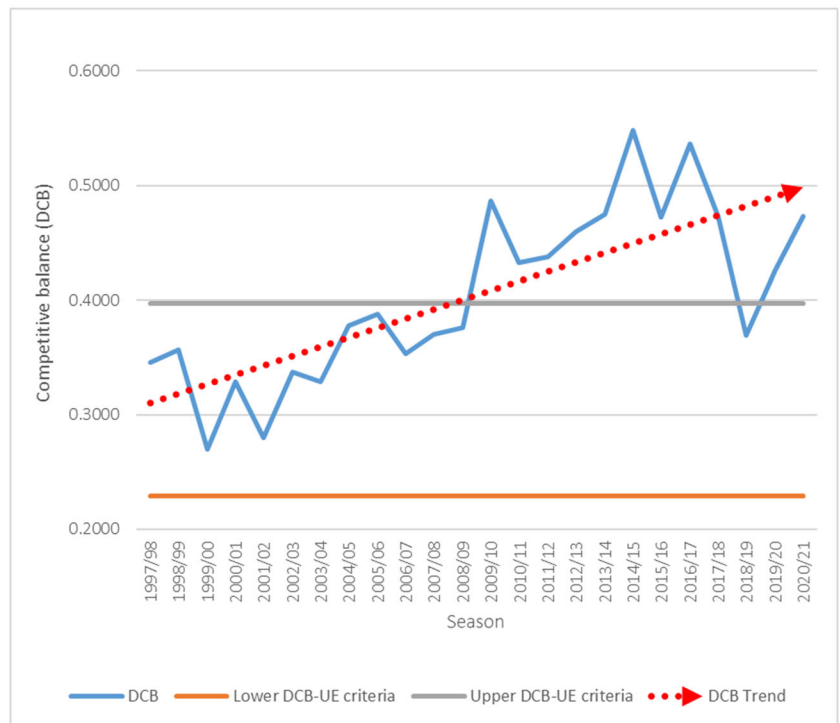
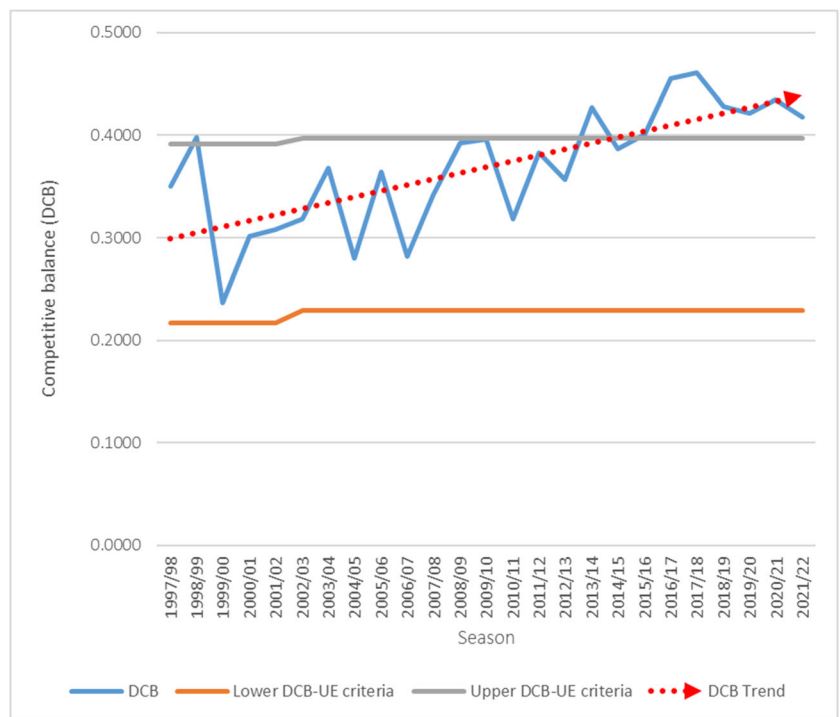


FIGURE 3 Evolution of distance to competitive balance (DCB) index. Ligue 1 (France) [Color figure can be viewed at wileyonlinelibrary.com]



The English Premier League (Figure 1) shows levels of concentration of results that, in most seasons, are above what would be the maximum concentration allowed in the markets. This trend is increasing (Figure S1).

The increasing trend is very marked in the Spanish Primera División (Figure 2), though the ‘worrying’ levels of concentration are evident from the first decade of the 21st century onwards (Figure S2).

In contrast, most of the seasons of the French Ligue 1 (Figure 3) show competitive balance levels within the admissible limits. However, the trend is increasing and—particularly in recent years—should be the subject of attention (Figure S3).

In the case of the German Bundesliga (Figure 4), the increasing trend is combined with competitive balance levels that have exceeded the maximums that would be allowed by the markets

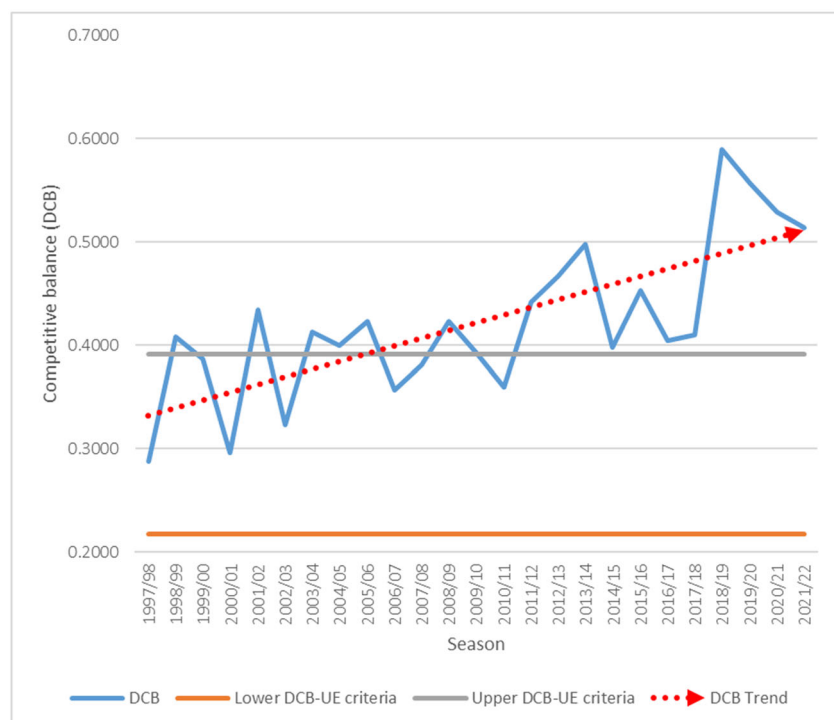


FIGURE 4 Evolution of distance to competitive balance (DCB) index. Bundesliga (Germany) [Color figure can be viewed at wileyonlinelibrary.com]

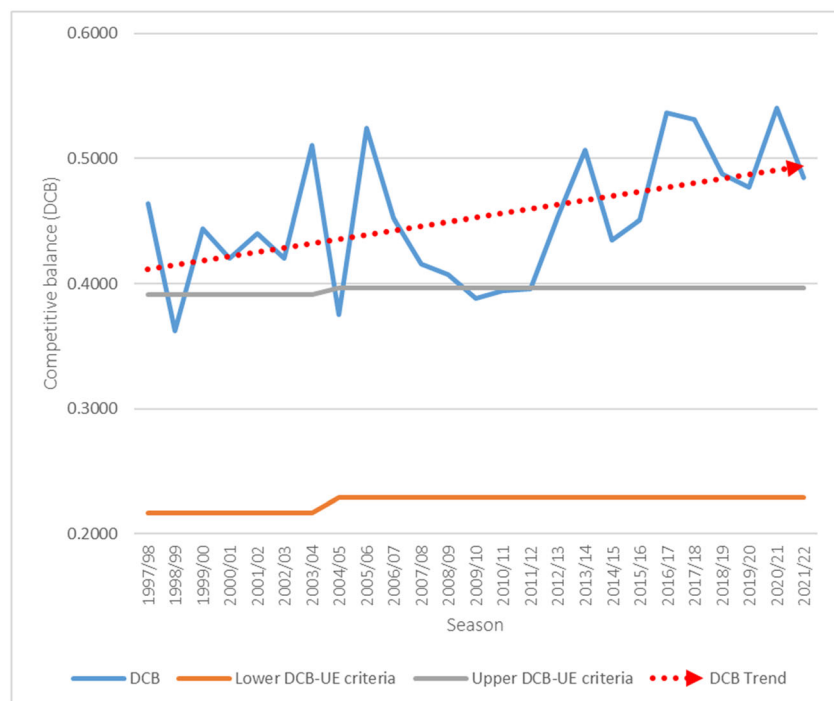


FIGURE 5 Evolution of distance to competitive balance (DCB) index. Serie A (Italy) [Color figure can be viewed at wileyonlinelibrary.com]

alternately over the seasons, albeit more markedly in recent seasons (Figure S4).

The Italian Serie A (Figure 5) shows a predominance of high levels of concentration and, although less strong, a growing trend (Figure S5).

3.2 | Relative economic potential, attendance and Financial Fair Play

If we only regress the competitive balance variable (CB) with the time trend variable without any control variables, except for the Italian

League, the slope of the regression line is significant, indicating the same conclusions as the descriptive analysis (p -values are significant at 99% for the English Premier League, Spanish Primera División and French Ligue 1 and at 95% for the German Bundesliga). In this sense, we have gone a step further and tried to explain the evolution of the competitive balance of each league by looking at four variables, one of which is the time trend. For each national league, this allows us to identify whether or not the increasing trend of the competitive balance is associated with other relevant variables.

We estimate the same model for each of the five national leagues. Each estimation has 23 observations. The model aims to explain the evolution of the competitive balance as a function of the evolution of variables linked to the economic potential and the demand and interest in football; it also tries to identify the possible effect of the main variable that, at the moment, promotes the competitive balance, such as the Financial Fair Play introduced by UEFA in 2011 and of the time trend itself. For each of the five leagues, the following has been estimated:

$$CB_t = \beta_0 + \beta_1 T_t + \beta_2 AT_t + \beta_3 ER_t + \beta_4 FP_t + u_t$$

where $T = 1, 2, 3, \dots, 23$ for the period 1998/1999–2020/2021.

AT: Average attendance. Average per game attendance of the 'Big Five' European soccer leagues in 1998/1999–2020/2021 (www.statista.com from www.transfermarkt.de). Data are in the 1000s. The study of the relationship between this variable and competitive balance is very prolific (García & Rodríguez, 2002; Peeters, 2011; Sung & Mills, 2018; among many others). Scelles et al. (2022) analyse the determinants of local stadium attendance in European men's club football; in addition, Scelles et al. (2022) introduce this variable with a lag as an explanatory variable for competitive balance. In our case, we

have introduced it without the lag. With a lag, it has less explanatory power in our model.

ER: Relative economic potential. Deloitte publishes data on the revenues of the world's leading football clubs (<https://www2.deloitte.com/ni/es/pages/consumer-business/articles/deloitte-football-money-league-2021.html>). We have constructed a variable in which, for each season, each league is assigned the percentage that its federation's club revenues represent in the total revenues of the top 10 clubs in Deloitte's list. In this sense, the variable approximates the relative presence of teams from each league among the most powerful in the world in economic terms. The 1998/1999 season is not available, and an average of the seasons before and after has been chosen.

FP: Financial Fair Play. Dummy variable equals to 1 over the 2011/2012–2020/2021 subperiod and 0 over the 1998/1999–2010/2011 subperiod (Peeters & Szymanski, 2014; Scelles et al., 2022; UEFA, 2018).

The stationarity analysis of the series indicates that ER is not stationary, so we have proceeded to estimate the models with the variable in differences. Indeed, the augmented Dickey–Fuller test and the Levin–Liu–Chu unit root test indicate the stationarity of the variables AT and DCB but not of ER. Table 4 shows the main results of the estimation.

In all five major leagues, the value of the independent term is significant. The parameter of the time trend represented by the variable T is significant and positive in the English, Spanish and French leagues. It is not significant in the German and Italian leagues. Therefore, even when considering other variables, the increasing trend is relevant in the first three leagues. The average per game attendance and the Financial Fair Play are statistically significant in the English league, but only weakly so.

TABLE 4 Evolution of DCB indexes in the major European football leagues 1997/1998–2021/2022

Leagues	Constant	Season (T)	Attendance (AT)	Relative economic potential (ER)	Fair play (FP)
Premier League	28.398*** (5.27)	0.958*** (0.26)	0.234* (0.13)	−0.023 (0.14)	−8.527** (3.43)
Primera División	27.024*** (6.70)	0.653* (0.34)	0.149 (0.23)	−0.168 (0.27)	3.149 (4.51)
Ligue 1	28.174*** (6.56)	0.715** (0.3)	−0.015 (0.26)	−0.662 (4.07)	−0.153 (0.64)
Bundesliga	34.355*** (4.43)	0.314 (0.27)	0.054 (0.11)	−0.538 (0.41)	1.484 (3.57)
Serie A	41.680** (14.67)	0.422 (0.38)	−0.073 (0.51)	−0.080 (0.19)	−1.217 (4.45)

Note: Standard error in brackets.

Abbreviation: DCB, distance to competitive balance.

* $p < .1$. ** $p < .05$. *** $p < .01$.

TABLE 5 Estimated panel data models

Model	Constant	Season (T)	Attendance (AT)	Deloitte (ER)	Fair play (FP)	R ²	χ^2/F
Within (league)	-	0.497*** (0.137)	0.072 (0.158)	−0.11 (0.096)	0.576 (1.739)	0.406	18.114***
Pooling	29.950*** (2.204)	0.506*** (0.152)	0.177** (0.07)	−0.155 (0.109)	0.084 (1.998)	0.359	15.399***
Random	31.936*** (3.963)	0.492*** (0.135)	0.107 (0.134)	−0.115 (0.095)	0.546 (1.730)	0.401	73.702***

Note: Standard error in brackets.

* $p < .1$. ** $p < .05$. *** $p < .01$.

Under these conditions, we proceeded to re-estimate the model as panel data. The results are shown in Table 5 and confirm the above conclusions. The time trend is significant in any model.

Therefore, it seems necessary to address these levels of concentration of results with measures that reinforce those being taken a priori or ex ante by the sports authorities. Avila-Cano et al. (2021) analyse the measurement of competitive balance using normalised indices in the presence of a change in the pattern of scores. In particular, Table 2 shows two issues. (1) That as the number of teams increases, the maximum value of HHI tends to decrease, which is evidence that an increase in the number of competitors favours competitive balance. (2) In addition, for each number of teams in a league, the maximum HHI with a pattern of scores {3, 1, 0} is higher than that with a pattern {2, 1, 0}; therefore, when the HHI is normalised, the denominator is higher, the normalised HHI is lower and competitive balance is higher. In this sense, the introduction of bonuses (which reward particularly offensive or defensive behaviour of the teams) is also an element that can have a favourable effect, as well as increase in the number of competitors, on the evolution of the competitive balance of a championship.

4 | CONCLUSIONS

The major European football leagues show a high concentration of results, and this tendency is increasing. These general conclusions coincide with a large part of the studies carried out by other authors cited in Section 1, in different periods and with reference to all or some of the major European football leagues. Although exceptions can be made for some time periods and some specific leagues, the competitive balance is low in general and shows a decreasing trend. However, unlike market concentrations, competitive balance is not evaluated by the sports authorities, despite the close relationship it has with such important issues such as (i) league managers' interest in maintaining a certain level of competency to make them more attractive to viewers; (ii) the added satisfaction of fans; (iii) the fans' degree of uncertainty about the final result; (iv) the odds handled by bookmakers and bettors; (v) how entrenched teams are in the advertising market; or (vi) players' decisions to belonging to one or another team, among other aspects.

Therefore, it seems reasonable to consider it desirable that sports authorities study the phenomenon and take measures that encourage competition. Besides Financial Fair Play, and the increase of the number of teams, there are additional mechanisms that should be considered by the authorities to ensure that minimum competency is met.

At the global level, sports authorities can consider putting structural corrective measures and behavioural corrective measures in place. These include divestment of assets (i.e., sales of players or disallowance of sponsorship), bans on operations (e.g., transfers or advertising contracts that generate a large amount of additional revenue and are not available to small teams) and a general requirement for contractual transparency among all parties (clubs, players, coaches, representatives and shareholders). Additional measures include

implementing regulations governing clubs' revenues and player transfers, where the transfer is intended not to strengthen the team but to weaken a rival's team.

In this sense, can the league scoring system influence the competitive balance? The effects of changing the scoring system in football have not been as clear-cut as might have been expected. As noted by Wright (2014), any change in the scoring system can have unexpected outcomes in terms of participant behaviour. Any change in the scoring system may affect statistical measurement of 'nominal' competitive balance (Avila-Cano et al., 2021). However, we cannot conclude that this change affects the 'real' competitive balance: For example, do players behave differently due to the change in the scoring system? Are coaches' guidelines different? In this regard, the evidence is not clear, and we need more studies to shed light on the potential impact.

Under the 3-point rule, one more goal in a match does not earn any additional points, and losing a goal costs 2 points instead of 1. Dillger and Geyer (2009) found that the leading team adopts a defensive strategy under the 3-point rule, resulting in fewer goal shootings by the team, as well as fewer shooting opportunities for the opponent. Conversely, the team that is losing plays offensively, as it is already behind and has nothing to lose. All other things being equal, the incentive of the losing team to play offensively is weaker than the incentive of the leading team to play defensively because the losing team gains just one more point by a goal, while the leading team loses 2 points. The bonus system employed in the rugby union since 2017 may prove useful in soccer, where bonus points are awarded for attacking and defending. This system can widen or narrow the remunerations per win and, ultimately, motivate players, thereby improving players' performances and increasing competition between teams.

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CONFLICT OF INTERESTS

The authors report there are no competing interests to declare.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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