
COMPETITIVE BALANCE IN FOOTBALL: A COMPARATIVE STUDY BETWEEN BRAZIL AND THE MAIN EUROPEAN LEAGUES (2003-2016)**EQUILÍBRIO COMPETITIVO NO FUTEBOL: UM ESTUDO COMPARATIVO ENTRE BRASIL E AS PRINCIPAIS LIGAS EUROPEIAS (2003-2016)**

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ABSTRACT

The present study compared the competitive balance (CB) of Brazilian professional football with those of Germany, Spain, France, England, Italy and Portugal first division leagues, between the period from 2003/2004 to 2016/2017. In addition, a trend line of the period and the overall effect was analysed. The CB was measured by the concentration of points by the first four teams placed in the final standings (C4ICB). Descriptive values showed that the competitions were not fully balanced (i.e. C4ICB > 100). (Md= 145, 148, 148, 152 and 155, respectively, $p < 0.05$), with no differences for France (Md= 140), compared to Germany, Spain, Italy, England and Portugal (Md= 140, $p > 0.05$). The CB trend lines for Spain, Portugal and the overall effect were significant and showed a decline in the period ($p < 0.05$). There was more stable behavior for Brazil and Italy, observing tendencies to significant models for the increments in the German and French leagues and a reduction in the CB in the English league. It is concluded that the Brazilian league was the most balanced in this period. Globally, there has been a growing inequality in these leagues, which may implicate in the success and attractiveness of the leagues in the future.

Keywords: Football. Competitive balance. Sports performance. Brazilian League.

RESUMO

O presente estudo comparou o equilíbrio competitivo (EC) do futebol brasileiro com os da Alemanha, Espanha, França, Inglaterra, Itália e Portugal), na primeira divisão, entre o período de 2003/2004 a 2016/2017. Além disso, verificou-se a linha de tendência do período e o efeito global. O EC foi medido através da concentração de pontos pelos quatro primeiros colocados na tabela final de classificação (C4 Index of Competitive Balance; C4ICB). Valores descritivos mostraram competições não totalmente equilibradas (i.e., C4ICB > 100). C4ICB do campeonato brasileiro (Md=133) foi menor em comparação aos da Alemanha, Espanha, Itália, Inglaterra e Portugal (Md=145, 148, 148, 152 e 155, respectivamente; $p < 0.05$), sem diferenças para a França (Md=140; $p > 0.05$). As linhas de tendência de EC's de Espanha, Portugal e de efeito global foram significativas e demonstraram declínio no período ($p < 0.05$). Para Brasil e Itália houve comportamento com perfil mais estável, observando tendências a modelos significativos para os incrementos nos campeonatos da Alemanha e França e redução de EC no campeonato da Inglaterra. Conclui-se que o campeonato brasileiro foi o torneio menos desequilibrado neste período. De forma global, houve uma crescente desigualdade de equilíbrio nessas competições no período analisado o que pode comprometer o sucesso e atratividade no futuro.

Palavras-chave: Futebol. Equilíbrio competitivo. Desempenho esportivo. Campeonato Brasileiro.

Introduction

Competitive balance (CB) refers to the balance of sports teams capabilities¹. Uncertainty in soccer results can be investigated by several methods, but from the practical point of view it is assumed that the most balanced league/tournament is one in which the point differences between competitors are as little as possible. Thus, CB reflects a greater chance for all participants to win the title or qualify for continental tournaments during a season.

A league championship with a good competitive balance is a priori more attractive, since uncertainty in the final result increases the public's interest², positively influencing the different revenues made by the league's participating clubs such as the revenues generated by

the ticket office, stadium operations, sponsorships and the broadcasting rights³. Therefore, when applying concepts of competitive sports, a balance is expected in the competitions between all the clubs, being in the sphere of a reduced number of unwanted associations¹. Consequently, if on the one hand the theoretical presupposition suggests that there should be increased competitiveness, on the other what has been happening in practice in some world championship leagues is exactly the opposite trend¹. For example, evidence from previous studies⁴ point to reduced CB in the 2009-2010 seasons in the main European national football leagues, especially in the English and Spanish leagues, where a small number of teams usually dominate over the long term. Demonstration of this effect is the concentration of wealth experienced by Spanish football through Real Madrid and Barcelona, which is recognized worldwide and has been a case for discussion and creation of theoretical frameworks that enable effective interventions to ensure competitiveness.

Although there has been talk of a decline in CB in world football⁴, much of the evidence is anecdotal, endorsed by European football. Different historical behavior for the Brazilian league championship is presented by a CB trend during the period of 1971-2009^{5,6}. However, for Brazilian football there has been little analysis of what has been happening to the CB in recent times or by a clipping from the new format in the Brazilian league. Due to the difference in the Brazilian league format starting from the 2003 season, a different CB tendency pointed out by other studies^{2,5,6} might have been occurring since that time.

Therefore, in considering the importance of CB for football managers and administrators, the present study had the following objectives: (i) to compare the CB of the first division Brazilian football league with the main first division European leagues in all the seasons that compose the current format of the first division Brazilian football league (the 2003/2004 until 2016/2017 seasons); and (ii) to verify individual and overall trend lines of the CB phenomenon in the cited period. In this way, understanding the CB since implementing the new format can evidence current indices on the increase or the decrease in competitiveness in the main football leagues around the world, presenting fundamental data to create strategies for the leagues to survive and to prosper.

Methods

Sample

The sample consisted of seven national first division leagues (Germany, Brazil, Spain, France, England, Italy and Portugal), analyzed during thirteen consecutive seasons (between 2003/2004 and 2015/2016). The choice of these leagues was based on whether they were governed by a similar competition model (i.e. double round robin, three points in case of victory, one point for a draw and zero point for defeat; similarities for becoming champion and obtaining classification for international tournaments, and in ascension and relegation to/from the lower division(s)) and for being considered the main world football leagues.

The standings for each of the respective leagues were consulted via the internet on the website www.soccerway.com, which has been widely used in studies of this nature⁷⁻¹⁰.

To analyze the CB, the C5 Index of Competitive Balance (C5ICB) originally proposed by Michel and Oughton¹ which analyzed that the concentration index of five companies in a standard industry sector measures the extent to which sector is dominated by the five largest companies in the industry. When applied to football, the concentration index of five clubs measures the inequality among the top five clubs in the final standings and the others. For the present study, the model used was an adaptation to the C4 index of competitive balance (C4ICB) because this approach better reflects the group of clubs qualified for continental

tournaments in most competitions, including Brazil. For this reason, this index was adjusted by Drummond et al.⁵ with the following equation:

$$\text{C4 Index of Competitive Balance} = (C4/4/N)*100 \quad \text{equation 1}$$

Where C4 corresponds to the points obtained by the first four placed in the season divided by the score of all the clubs, and (N) is equal to the number of clubs that composed the league. In a fully balanced championship, C4ICB is equal to 100. If the C4ICB is greater than 100, this progressively reflects a lower CB¹.

After descriptively establishing the CBs, we followed the inferential analysis aiming at comparing the countries and establishing individual trend lines and overall effect of all the investigated leagues. At this point, the study proposed an analysis of the CB index progressions measured for the aforementioned leagues over a period, in this case between the years 2003/2014 and 2016/2017. From the tabulated data, adjustment models were performed using linear regression and obtaining angular and linear coefficients capable of assisting in describing and quantifying the trends of the analyzed data over the period.

The proposed outline for the present study was designed to have updated evidence on the phenomenon of CB and thereby guide the forming of hypotheses in future studies. A concentration of points from the first four places (C4IBC) was considered for the present study in order to better understand the procedures used for calculations and practicality of the results found in relation to the league as a whole. Other calculation procedures for this CB slope as the standard deviation of the percentage of wins or even the standard deviation ratio would only represent seasonal uncertainty and not the uncertainty of the championship because of the dominance of certain teams (performance concentration; first in the standings) is not taken into account^{11,12}.

Statistical analysis

Data were presented as mean \pm standard deviation, median, 25th and 75th percentile, and minimum and maximum values. Assumption of normality was corroborated by the Lilliefors test. Assumption of homogeneity of variance was tested and confirmed by Levene's test. One-way Anova was used to compare the continents with post-hoc Tukey HSD application. Simple linear regression was used to establish a linear trend, better adjustment of slope value and CB intercept over the analyzed seasons. All statistical analyzes were performed by Sigma Plot 11.0 software for Windows (Chicago, IL, USA). A *p-value* < 0.05 was considered for the significance level.

Results

CB analyzes showed that all countries had a greater C4ICB than 100, thus revealing unbalanced competitions in the first division between the 2003/2004 to 2015/2006 seasons (Figure 1).

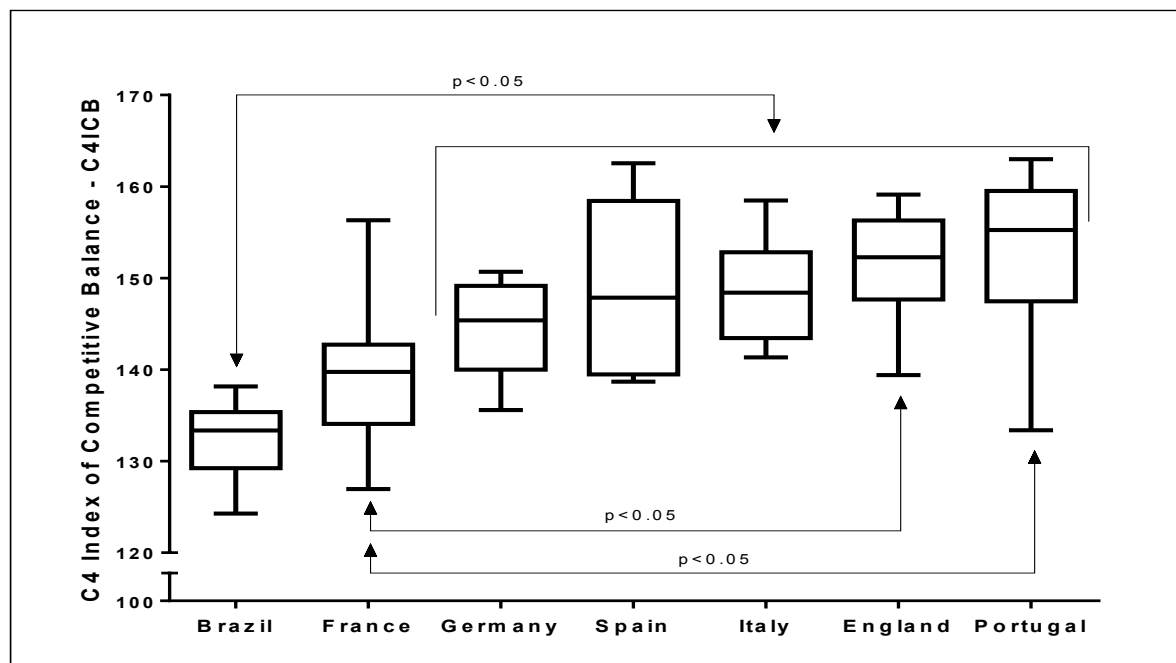


Figure 1. Competitive balance in the first division in the seven analysed countries.

Note: Lines without arrows define groups and lines with arrows determine the comparisons with statistical difference ($*p < 0.05$). Data presented as median, 25th and 75th percentile, and maximum and minimum values.

Source: The authors

In Brazil, there was a smaller C4ICB (132 ± 4 ; Md = 133) compared to the leagues in Germany (144 ± 5 , Md = 145), Spain (149 ± 9 , Md = 148), and Italy (148 ± 5 ; (140 ± 8 , Md = 140, $p = 0.05$), but with no significant differences for the French league (140 ± 8 , Md = 140, $p = 0.05$). In the other comparisons paired by post hoc, a lower C4ICB index was observed in France compared to Spain, Italy, England and Portugal ($p < 0.05$). Germany's league had a lower C4ICB index compared to Portugal ($p < 0.05$). There were no significant differences between the other comparisons ($p > 0.05$).

The slope values and intercepts of the simple linear regression analysis are shown in Figure 2 and 3. The generated CB models for Spain's first division league (Fig 2, b), France (Fig 2, d), Germany (Fig. 3, a), Portugal (Fig. 3, c) and the overall effect of all the studied countries (Fig. 3, d) showed significant models ($p < 0.05$), while the generated models were not shown to be significant ($p > 0.05$) for the Brazilian (Fig. 2, a), English (Fig. 2, a) and Italian (Fig. 3, b) leagues. Regarding the trend lines and evaluating the models that were shown to be significant, it is observed that the leagues of Spain (Fig. 2, b), France (Fig. 2, d), and Germany (Fig. (Fig. 3, d) presented an angular coefficient of the positive adjustment lines, indicating an increase in the imbalance rate of the leagues over the studied period. It also observed a negative angular coefficient for the English league, which indicates a reduction of the C4ICB rate on the time line (Fig. 2, c).

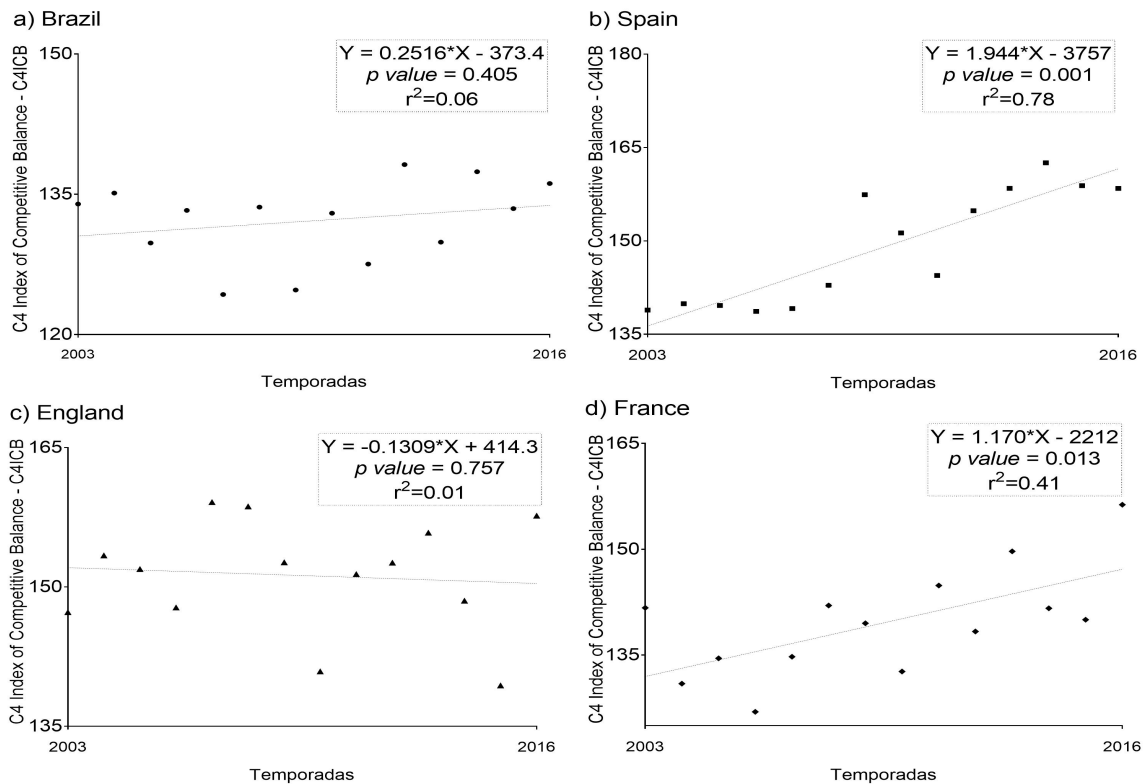


Figure 2. Linear regression model for domestic first division football leagues

Note: Each point indicates the individual values for each season analysed in each country (a=Brazil, b=Spain, c=England and d=France). Rectangles in each Cartesian plane in the upper right first quadrant indicate the generated model, its significance (exact p-value), explained variance (r^2) and generated regression line (dashed line) at a confidence interval of 95%

Source: The authors

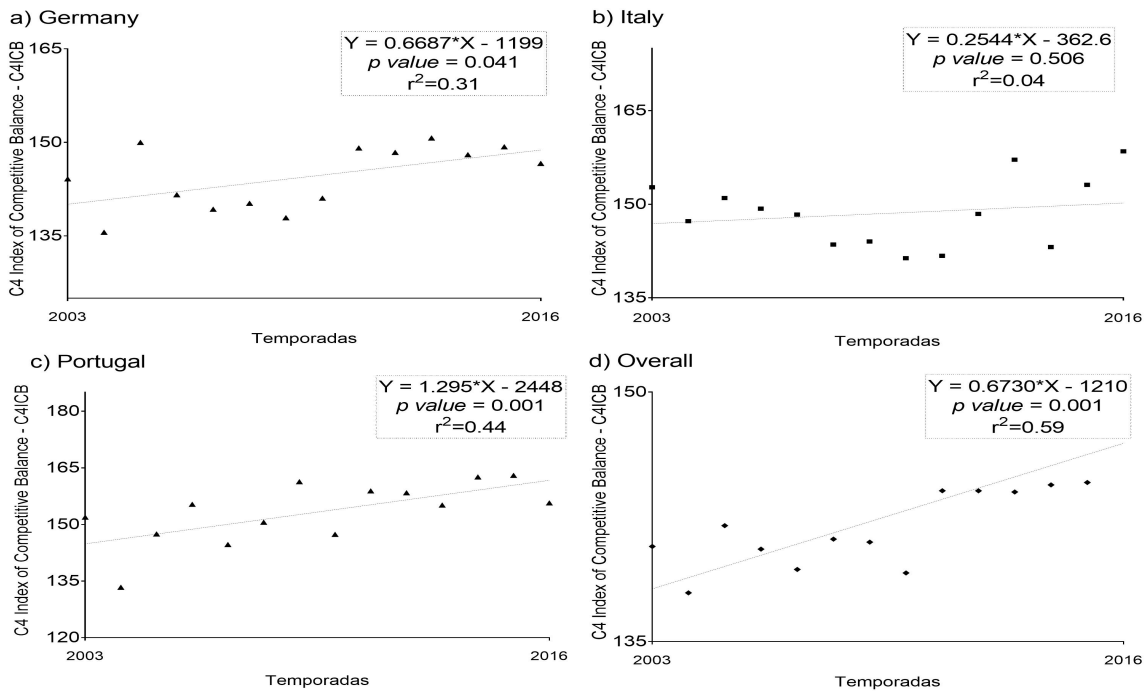


Figure 3. Representation of the regression model for domestic first division football leagues

Note: Each point indicates the individual values for each season analysed in each country (a = Germany, b = Italy, c = Portugal) and the overall effect of all countries (d = Overall). Rectangles in each Cartesian plane in the upper right first quadrant indicate the generated model, its significance (exact p-value), explained variance (r^2) and generated regression line (dashed line) at a confidence interval of 95%

Source: The authors

Discussion

The objectives of the present study were: (i) to compare the CB of Brazilian first division professional football with the main European first division leagues in the 2003/2004 to 2015/2016 seasons; and (ii) to verify individual and global CB trend lines, accessed by the C4ICB which is an index that reflects the concentration of points by the first four places in the final league standings played under the points system. The main evidence of the present study relates to higher CB (i.e. $< C4ICB$) in Brazilian first division football compared to the main European countries, with the exception of France with a small increase in the analyzed period. It is noted that the generated model was significant for increasing competitive imbalance in the football timelines for Spain, Germany, France and Portugal. In addition, when the C4ICB was analyzed globally (all countries on the time line), the significant model increased, meaning there was an imbalance increase in the main national leagues of the first division within the analysed period.

The results of the present study corroborate the findings of Levy⁶, who analyzed the CB through the “Herfindahl index” and compared the Brazilian league with the European leagues. In the aforementioned study, there was a higher CB in the Brazilian league between the seasons from 1997 to 2010. In addition, the CB values of the first division Brazilian league observed in the present study confirmed the results of Drummond et al.⁵ which also showed a good CB in the Brazilian league from 1971 to 2009. This study also noted a decreasing tendency in the concentration of points by the first four teams in the standings in relation to the others after changing the league format to cumulative points in 2003 ($C4ICB \sim 130$, between 2003 and 2007), as well as a notable increase in the number of participants. This last evidence is also corroborated by the present study, which evaluated the whole period with a league system by cumulative points (last 14 seasons), noting a small increase in the C4ICB rate on the time line, but with a non-significant model.

In Brazil, the explanation for a smaller imbalance via C4ICB in relation to the main European leagues is quite complex and seems to have some unique cultural aspects⁶. For example, as reported by Levy⁶, the economies of clubs and leagues is naturally emerging and depends on increasing resources in terms of structures, TV rights and partnerships. An important aspect that deserves attention is the financial issue due to a lack of resources or misadministration of the clubs (many of them, even those of great prominence, remain in debt). Therefore, historical management directs clubs to sell their best players, which may make them less qualified/competitive temporarily (i.e. because of European and Chinese transfer windows where the team may be disqualified during the league). Obviously, better performing teams are more targeted for transferring players in the mid-year transfer window. In this way, the rosters change a lot and professional mismanagement in Brazilian football ends up impeding clubs’ stability. This behavior contributes to the uncertainties of sports performance and consequently to greater occasional/unintentional CB.

Another aspect recognized as being differentiated in Brazilian football is the so-called homefield playing advantage (HA) and the territorial characteristics of Brazil, which presents great extension and climate differentiation, which may help to explain the differences observed in European football. For example, when analysing the theory around other principles to make balanced competition, it is found that the HA complicates the intention of CB. After all, even if all teams have equal competitive power, all game results can then be tilted in favor of the home team, as stated by Forrest et al.¹³. Thus, it seems that the advantage of playing at home in Brazilian football compensates for the disparity of investments by clubs mainly in the southeast region, which are financially superior when compared to the other Brazilian regions. Therefore, home advantage would enter as compensation for the weaker

and more remote teams^{8,10}, where locally they would perform better even with lower competitive quality¹⁴. It is worth mentioning that such a hypothetical condition is only plausible if we consider that HA is statistically higher in Brazilian football in relation to the European leagues^{7,10}.

In Brazil, a situation more balanced by contextual conditions can be expected, since factors such as local crowds, familiarity, referee bias, greater fatigue in visitors due to the long trips can compensate for the disadvantage of competitive power presented by the home team. Therefore, HA effect explanations toward the greater CB in the Brazilian league in relation to the European leagues seems to have foundations. For example, Pollard et al.⁹ identified that the travel distance had a significant effect on the outcome of the game ($p < 0.01$). In the generated model, these authors suggested that 0.115 of a goal for the home team could be expected every 1,000 km traveled by the visiting team. On the other hand, in European countries where cities are closer to each other and therefore less adverse climate conditions, environment, and shorter travel with greater comfort do not exert as much influence on the HA phenomenon as in Brazil. This possibility can be noticed in the better conditions of European transport, which are generally more effective and cause less fatigue, thereby giving better psychological perception for energy and physical disposition for good performance, which would help in facing the opponent in away games^{15,16}. New studies are suggested to test the plausibility of the HA phenomenon on the competitiveness of football leagues.

Drummond et al.⁵ recently revealed that changes in Brazilian football such as a reduced number of teams and starting the rule of cumulative points would have contributed to increase league competitiveness since its creation in 1971. This corroborates the findings of the present study that identified a lower imbalance rate in the Brazilian league in recent periods, with small increases in the angular coefficient in the generated linear regression model. For example, during the analyzed period, the Brazilian league had seven different champions. In France, another C4ICB-like league to Brazilian football, despite having 6 different champions in the period, there are particular characteristics with a predominance of only two champion clubs (Lyon won 36% of the titles and PSG 36%). Perhaps as an effect of PSG's financial power, the French league presented a significant increase for competitive imbalance starting from the 2010/2011 season. For other countries we can see an undesirable effect from the viewpoint of sports economy, with a small number of leagues (usually between the so-called Big Three), which could jeopardize the CB long-term. For example, in Italy the titles were focused on 3 clubs: Juventus (50% of the titles); Inter Milan (36% of the titles) and Milan (14%). In England, the title concentration in the period was mainly divided between two large clubs (Manchester United and Chelsea) which accumulated nine titles in the period (~72%). In Portugal, the champion's situation is even more concentrated. Porto won 57% of the titles, while Benfica won 43% of the time. In Spain, the concentration of titles won is also limited to a few clubs. Barcelona, for example, won the most titles (57%), while Real Madrid is in second place with 29% of the titles, followed by Atletico Madrid (7%) and Valencia (7%), who won only once each from 2003/2004 to 2015/2016.

Perhaps because of this title concentration between a few clubs and/or repeated Champions League standings and associated prizes, it has made some championships extremely unbalanced over time in Europe. In a study that examined the CB for six decades (the period 1945/46 to 2005/2006), there was a decrease in CB on the time line in England, and there was weak evidence that this occurred in the Netherlands and Belgium. The results of the present study with recent seasons analyses for the CI4CB rate increases for football in Spain, Germany, France and Portugal contradict the findings of Haan et al.¹⁷, which did not find any consistent CB change in the period 1945/46 to 2005/2006. However, with the update

of the present study, it is noted that the significant CI4CB increases in the overall effect of all the countries studied may show inadequate behavior for the economy of the league in the long-term.

Over the last decade, a variety of factors (i.e. concentration of resources for major clubs, new player transfer policies, adverse scenarios for sponsors) led to a decrease in CB and an increase in risks faced by the football industry such as the emergence of rival leagues, loss of public interest, and difficulties in attracting resources. However, Hann et al.¹⁷ drew attention to the more eminent CB reduction from the access of a team into the European Champions League. One possible explanation for this is that few clubs end up benefiting from the financial transmission and associated funding associated with access to European competitions. Along these lines, Michel and Oughton¹ conducted a more detailed analysis on club revenues and revealed that there are three main sources of revenue growth that can have an unequal impact on club fortunes and that consequently differentiate the competitive strength of teams reoccurring at the top and bottom of the leaderboard. Among the possibilities of increased revenues for the first teams (i.e. 4) are: (i) broadcasting resulting from the sale of national television rights; ii) Champions League revenue from broadcasting rights, game day income and sponsorships; and iii) improving financial management and corporate governance in some clubs.

According to the observations by Michel and Oughton¹, the greater the likelihood of a team's success can result in increased funding and concentration of financial resources (greater sales of sports merchandise, greater competition for sponsors, brand enhancement, increased valorization of TV game rights) and consequently contracting players of greater competitive capacity, especially when qualifying for the most impressive championships such as the UEFA Champions League for Europeans and Libertadores of America for South America. Awards resulting from these continental competitions and repeat participation create a vicious cycle of prospects for a small number of teams that earn relatively large sums of money compared to the others, and as a result the home CB can be compromised. Such instability in the CB may result in a number of risks such as loss in fan/spectator support, bankruptcy of clubs and even threats of success by rival leagues¹.

In attempting to alleviate the lack of CB, some related interventions have been sought in several areas. Both in Europe and in Brazil, the Bosman Law and the Pelé Law, respectively, aim to regulate the labor market by protecting the fairness of resource distribution between the teams of their respective leagues and reserving the rights of the players. In spite of this good intention in practice, the results of these laws were not so effective in terms of the CB and performance in the league standings as evidenced in the present work, with European clubs having high C4ICB indexes perhaps due to the concentration of financial resources, which then returns greater competitive power to a small group of clubs, repeating itself in a vicious cycle.

In Europe, for example, it is observed that even with the Bosman Law changing the circulation of players without imposing a maximum number of European foreigners on a team for most leagues, as well as eliminating the question of player transfers, it still allowed several clubs to out-strengthen their competitors. In this way, clubs with greater purchasing power were able to form true European teams, plus a few but very talented South American and African players. This may have conferred lower CB in some European countries studied in the present study, especially in the Spanish and Portuguese leagues that saw a significant entry of South American and African players in the 1990's, for example. On the other hand, due to domestic policy issues, the German and French clubs have additionally tried to keep the CB in their leagues. Thus, according to specific regulations, clubs are required to keep a high

number of domestic players on the squads, making the teams remain more competitively balanced⁴.

Brazil already has rules that try to maintain parity and a greater technical (i.e. competitive) balance in other sports. For example in volleyball, which has worked until recently with player rankings, establishing athlete scores that add up to a maximum allowed per club in casting through drafting systems to solve this “problem”, bringing greater competitiveness to smaller clubs; numerous sports leagues employ other regulatory solutions such as imposed salary caps, which could be applied to individual players, to teams as a whole, or even both cumulatively. These strategies have long been used in the NBA, which developed mechanisms to ensure equality between its components such as wage limits, drafting and the fact that it is a closed model.

Other good practices attempting to increase CB can be noted in English football which have recently been considered and that have possibly softened the unbalance evidenced from past decades as demonstrated in the present study through the angular coefficient of the straight line adjustment model for that league. The English Premier League distributes television revenue into three slices: 50% equally, 25% according to the league standings, and 25% considering the number of games transmitted, but with an important detail; there is a contractual guarantee of a minimum number of games transmitted per team. Last season, the club with the lowest quota received 65% of the champion in revenue. For comparison purposes, until last season Barcelona and Real Madrid had about half of La Liga’s revenues, but starting from the 2016-2017 season they are expected to keep 1/3 of the slice.

A truism is that "Spaniardization" is not the way to be followed, because Spain itself was forced to rethink its model. If achieved, this unpredictability brings interesting gains to football as a product, such as acceleration in the innovation cycle, since the greater balance requires continuous and rapid elaboration of new strategies to better opponents, diversification of tactical schemes, and to improve the recruitment and preparation process for talent. In this way, understanding the CB in recent years using other tools and economic or competition/ranking scores can show data about the reality of the competitiveness in football leagues, presenting itself as being fundamental to create strategies for the competition to survive and prosper.

The theme takes on importance when thinking about football as a business, as the loss of CB (as already mentioned) in the overall effect of the major leagues throughout the world can cause serious financial damage and jeopardize the future of these competitions. Based on the premise that maintaining the CB generates more profit, sports leagues not only need this to remain strong, but also to keep growing¹. Thus, in the concrete case of the Brazilian league, its greater competitiveness represents an advantage for the league, demonstrating improved CB indexes and fan interest that increased after the 2003 season, when the league began using accumulated points¹⁸.

Conclusions

The CB in the Brazilian first division professional football league proved to be bigger in relation to the main European leagues, and it was shown to have a more stable profile in the period of 2003/2004 to 2015/2016. This reaffirms evidence in periods prior to the current league format. CB trend lines in the Spanish and Portuguese leagues were significant and showed an increasing imbalance tendency throughout the analyzed seasons. When considering all leagues, an overall effect for imbalance is noted. This suggests a growing inequality between the teams that occupy the first four places in relation to the other teams in the main leagues in the world. This

trend of decreasing CB deserves to be followed, as a smaller CB can compromise the success of the major world leagues.

Even by recognizing a higher CB in the first division Brazilian league, it must still be recognized that it is necessary to develop and professionalize the Brazilian football market in order to obtain a product with greater international reach, creating strategies for keeping the best players in their clubs, improving the system sales transfers and complementary services, as well as reinforcing the image of the infrastructure/equipment/arenas to increase attendance, comfort and public attention. Future studies may address strategies for how to improve competitiveness and discuss the optimal CB level of the major football leagues. Attention may be given to South American football, which (as in Brazilian football) has a management model that is historically focused on player transfers for profit.

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