

## Article

# A Central Element of Europe's Football Ecosystem: Competitive Intensity in the "Big Five"

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**Abstract:** This study perceives professional European football as one of the most relevant event-related entrepreneurial ecosystems (EEs) worldwide. It also identifies a healthy sporting competition in the five most popular European football leagues (Spain, England, Germany, Italy, and France), the "big five," as a key pillar for the functioning of this ecosystem. By applying a quantitative approach, competitive intensity (CI) is measured for all big five leagues for 21 seasons (1998/99 to 2018/19). The chosen method does not only convey an overall indication of the competitive health of the entire league but also provides detailed information on the four important sub-competitions (championship race, qualification for Champions League or Europa League, and the fight against relegation). In all five leagues, seasonal CI tends to decrease over time, and especially over the last decade. The main reason is a decline in the intensity of the championship race while all other sub-competitions show relatively robust CI values. Overall, it can be concluded that the competitive health of the big five is intact, but the dwindling CI of the championship races can harm the EE of professional European football in the long run. Accordingly, it should be closely monitored in the future.

**Keywords:** European football; competitive intensity; competitive balance; entrepreneurs; ecosystem; league management; championship race; relegation; Champions League; Europa League



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## 1. Introduction

Professional football in Europe has developed into a multi-billion euro business [1] and its "social and political significance [ . . . ] has increasingly been recognized" [2] (p. 3). This relevance is closely linked to a continuous flow of innovative ideas in terms of new services and products. Examples are new ways of bringing the matches to the fans (like streaming or second screening), new (electronic) ways of distributing tickets, engaging with fans over social media, opening up to eSports, etc. Having this in mind, it also has to be noted that the national league systems in European football are limited open leagues, with promotion and relegation that extend from the lowest amateur leagues to the highest levels of professional football. This means that the European football system is inherently innovative and growth-oriented because promotion to the highest national level and eventually participation in the European Union of European Football Associations (UEFA) competitions (Champions League, Europa League) are the ultimate goals for many clubs, even at the non-professional level. Even though growth orientation and innovativeness are central characteristics of entrepreneurial ecosystems [3,4], this is neither the only nor the most relevant reason why we propose to understand the multi-faceted ecosystem of professional European football as an entrepreneurial ecosystem (EE).

When assessing the structure of this EE, it becomes apparent that the so-called "big five" are a key element and a central driver of its societal and economic importance. The big five are Europe's most popular national football leagues: La Liga (Spain), Premier League (England), Bundesliga (Germany), Serie A (Italy), and Ligue 1 (France). These leagues

draw very large amounts of money and attention into the EE of professional European football and are a main reason for its inherent potential and attractiveness.

Against this backdrop, this study was motivated by Cavallo et al., who identified the following research question as relevant for the scrutiny of entrepreneurial ecosystems: “How is the EE’s sustainability ensured?” [4] (p. 1312). If this question is asked regarding the EE of professional European football, the answer is very multifaceted. To contribute a very relevant piece to the overall picture, this study will focus on the sporting competition in the big five because an intense sporting competition is the key component of each sports league [5]. Due to their central role in the EE of professional European football, it is obvious that maintaining an intense sporting competition in the big five is an important factor for the sustainability of the entire EE. But looking at the 10 seasons before the onset of the Corona pandemic, it must be asked if an intense sporting competition is characteristic for the big five as only a very small number of clubs have won titles in the different leagues (Table 1). In La Liga, seven titles went to Barcelona, two titles went to Real Madrid, and one title went to Real’s city rival Atlético (7-2-1). In the other leagues, the corresponding figures are Premier League (4-3-2-1), Bundesliga (8-2), Serie A (8-1-1), Ligue 1 (6-1-1-1-1).

**Table 1.** Championship titles of the seasons 2009/10 to 2018/19, modified after Drewes and Rebergiani [6].

La Liga		Premier League		Bundesliga		Serie A		Ligue 1	
Club	Title	Club	Title	Club	Title	Club	Title	Club	Title
FC Barcelona	7	Manchester City	4	FC Bayern Munich	8	Juventus Torino	8	Paris Saint-Germain	6
Real Madrid	2	FC Chelsea	3	Borussia Dortmund	2	Inter Milan	1	AS Monaco	1
Atlético Madrid	1	Manchester United	2	-	-	AC Milan	1	Montpellier HSC	1
-	-	Leicester City	1	-	-	-	-	Lille CSO	1
-	-	-	-	-	-	-	-	Olympique Marseille	1

Based on Table 1, it can be assumed that the intensity of the sporting competition in the big five is at risk, which should constitute a fundamental problem for the EE that is built around them. If the leagues’ attractiveness should continuously lessen, so should their relevance and economic potential, which would directly impact the ecosystem. Entrepreneurs and other actors in this ecosystem would encounter lessening opportunities, which would, in turn, lessen the attractiveness and relevance of the EE of professional European football as a whole.

This study takes a profound look at the sporting competition in the big five. But the specifics of European professional football demand that we widen the scope in comparison to Table 1 because professional European football leagues are not only about winning the championship [7]. Qualifying for UEFA competitions and staying in the league (avoiding relegation) are crucial sub-competitions as well. This means that the intensity of the sporting competition in the big five cannot only be determined by looking at the championship race but rather by taking all relevant sub-competitions into account.

Accordingly, this study will analyze the sporting competition in the big five using competitive intensity (CI) as an indicator. Research on the CI in sports leagues is a rather new field. CI was first noted by Kringstad and Gerrard [8–10] as the degree of competition within a league regarding its prize structure. In the big five, the most relevant “prizes” are the championship, qualification for Champions League and Europa League, and avoiding relegation. To date, literature specifically focusing on CI is scarce [7,11]. Even though one recent study has profoundly looked at the CI of Germany’s Bundesliga [7], no comprehensive analysis of CI in the big five has been conducted so far.

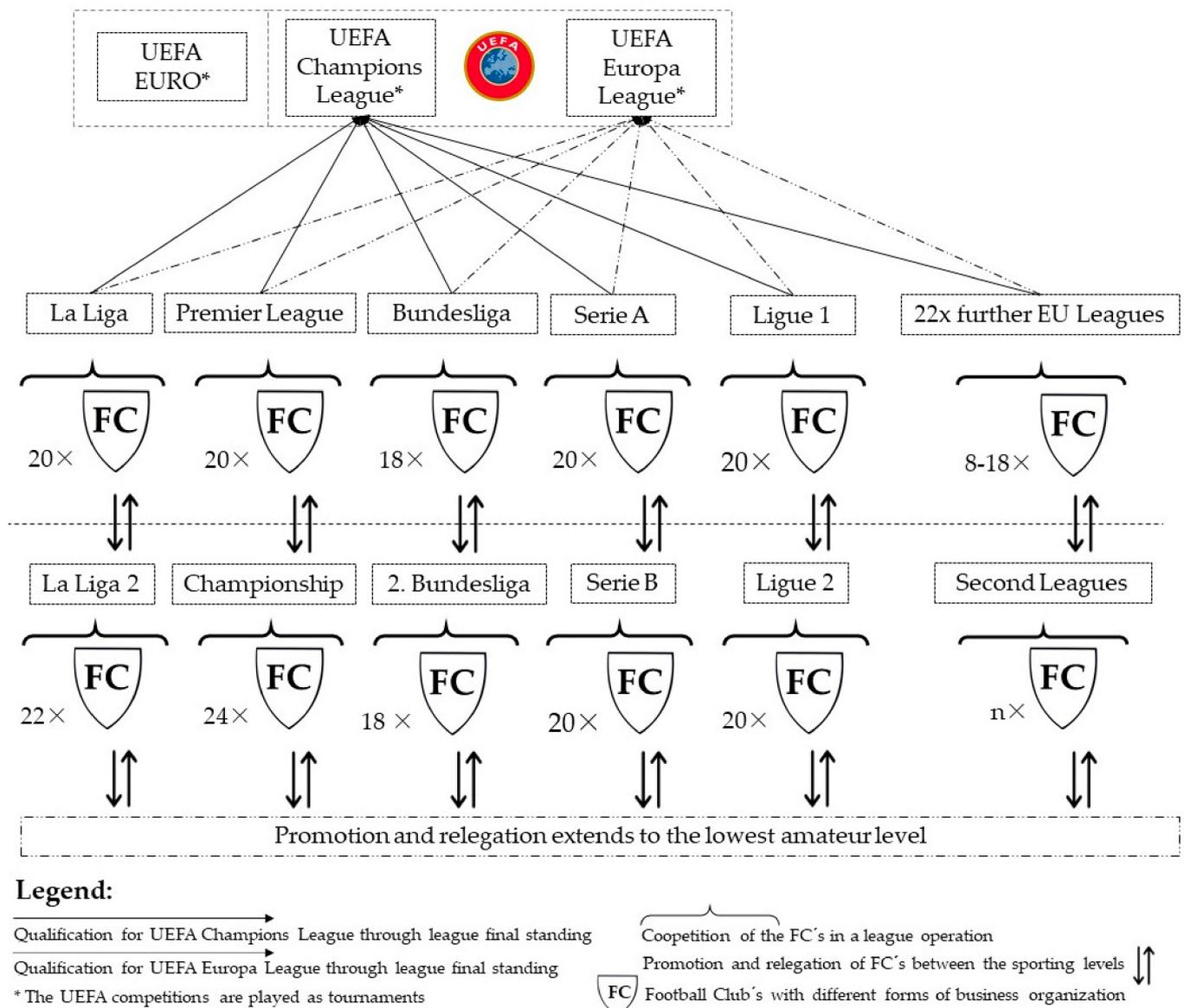
This paper aims at closing this research gap by providing such a comparison. More specifically, the CI-Index-Model of Wagner et al. [7] will be used to not only scrutinize overall CI (for the entire league) but to also take a specific look at the CI in the four most relevant sub-competitions. The examination period covers the seasons from 1998/99 to 2018/19. It was chosen because clubs have been able to qualify for the reformed UEFA Champions League and the restructured UEFA Cup (later Europa League) since 1998/99, which still is the case today. The last season that was not severely affected by the Corona pandemic was 2018/19.

The paper is structured as follows: In the next chapter, the structure of the EE of professional European football is briefly described. Afterward, the literature review provides an overview of relevant research and outlines the reasons for choosing the CI-Index-Model of Wagner et al. [7] for the analysis conducted in this study. Hereafter, relevant methodological specifics of this model, as well as the data collection, are outlined. Next, the results are described. The following discussion addresses the relevance of the findings for the EE of professional European football and other important aspects, implications, and limitations.

## 2. Entrepreneurial Ecosystem of Professional European Football

Our perception of professional European football as an EE is based on Stam's and Spigel's definition of EEs "as a set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship within a particular territory" [3] (p. 1), or [12] (p. 1765). Many of the actors in professional football in Europe cannot, of course, be considered "entrepreneurs" in the sense that they are "individuals exploring opportunities to discover and evaluate new goods and services and exploit them to add as much value as possible" [3] (p. 1), or [13]. But looking at the basic structure of European football, it becomes clear that it provides an enormously large platform for exactly this type of activity because football is an event-based sport. As can be seen in Figure 1, this means that the multi-faceted professional European football system comprises very different types of organizations. These organize events of very different sizes and scopes that range from matches in smaller leagues or at stadiums of small clubs to the matches in the UEFA Champions League or the UEFA EURO.

It has to be noted that sports events can generally be understood as platforms for interactions of networks of different actors for whom the event is an opportunity to co-create value [14] (on the concept of value co-creation, see [15,16]). Obviously, these networks include players, clubs, and other actors immediately involved in the sporting competition but also those who are only involved indirectly, such as leagues, associations, or federations, because they provide the framework in which these events take place. Furthermore, these networks can encompass a multitude of other actors. On the one hand, individuals such as players, coaches, spectators, volunteers, and club employees are virtually always represented. On the other hand, sponsors, event agencies, digital businesses, all forms of media, the sporting goods industry, investors, security, caterers, and the entire hospitality industry can be involved in the event or profit from it [14,17–19]. This is very relevant here because it means that each event in the EE of professional European football (Figure 2) gives a multitude of (potential) entrepreneurs and established firms besides the clubs, associations, and federations "the opportunity to use it as a means of offering their value proposition" [20] (p. 71) or [21]. Due to this, the EE of professional European football can and should be understood as probably one of the most relevant sport event-related EEs worldwide.



**Figure 1.** The professional European football system.

As illustrated in Figure 1, the big five are the central pillar of professional European football. They can also be considered a major driver for the past and future development of the EE in which they are embedded (Figure 2) because they bring large amounts of economic resources and attention to the ecosystem. In the 2018/19 season, for instance, the big five have increased their cumulated revenues to EUR 17.0 billion [22], a large portion of which is distributed within the EE depicted in Figure 2. Furthermore, they are Europe's leading leagues in terms of brand value [23], accounting for 77% of total club assets [24]. Moreover, the top 15 European clubs in terms of attendance (14 from the big five) had a cumulative total of more than 1 million spectators in the 2018/19 season [24]. Over 130 million fans follow the big five [25] and many of the world's best footballers play there [26]. As has been outlined in the introduction, the main reason for this societal and economic relevance is the sporting competition in the big five, which is also the main focus of this paper. In the next chapter, relevant research on the topic will be presented.

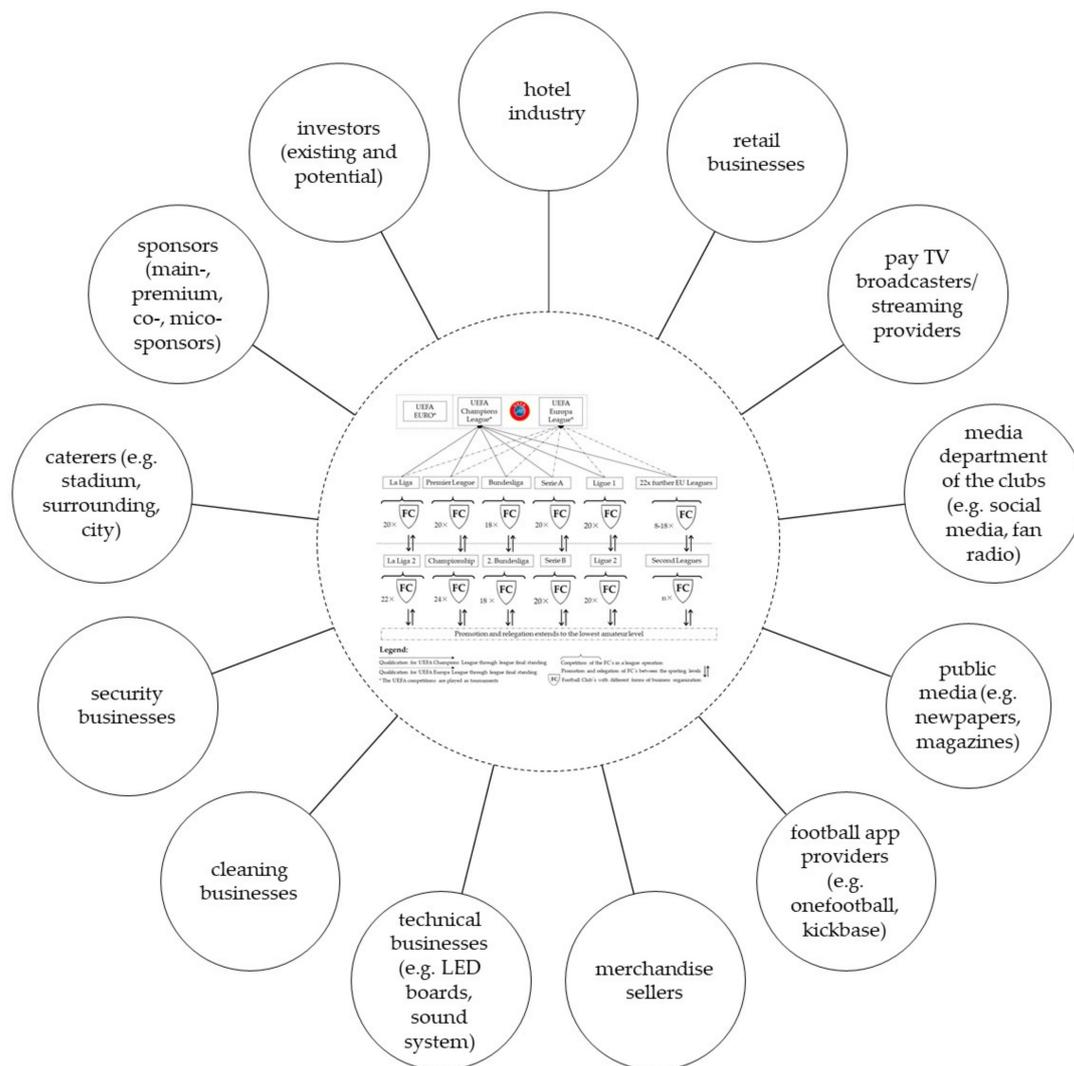


Figure 2. The entrepreneurial ecosystem of professional European football.

### 3. Literature Review

In the past, several studies were conducted on competitive balance (CB) in the big five [5,27–29], and CB was frequently emphasized as a key parameter for the sustainability of team sports leagues [30–36]. But CB does not look at the sustainability of the sporting competition or its structure. It is rather oriented toward financial figures, which very closely relates to the closed and profit-maximizing professional sports leagues in North America. These have several mechanisms that are aimed at securing a certain financial balance (salary caps, revenue sharing, draft systems, etc.). However, European football has limited open leagues and is win maximizing [37–41]. Therefore, European football is not primarily interested in having a balanced competition in economic terms. Accordingly, the efforts that are made by UEFA or the national league organizations to ensure financial stability (i.e., Financial Fair Play or licensing processes) are not (primarily) aimed at creating a financially level playing field. In fact, European football clubs have very different economic means at their disposal [32,42–45] and thus, for example, do not all have equal chances of signing desired players.

Another difference is that in North America, during the regular season teams usually aim first at qualifying for the playoffs and then ideally to win the championship by successfully participating therein. In contrast, the round-robin (RR) schedules that are common in Europe and present in all of the big five determine much more than solely the champion. Jennett [46], followed by Baimbridge et al. [47], Cairns [48], and Dobson and Goddard [49],

recognized that in addition to the championship race, the fight against relegation is also a relevant and exciting sub-competition. Since the invention of the European Champion Clubs' Cup in 1955 (later named UEFA Champions League), qualifying for a supranational competition of UEFA through the top-tier leagues or cups has also been attractive. With the changes in UEFA competitions and the fact that not only can the champions and the national cup winners qualify [50], the qualification slots for the Champions League and the Europa League (former UEFA Cup) have emerged as curial competitions within European football leagues. Therefore, the sporting prize structure of the big five leagues currently has four fundamentally distinct sub-competitions: the championship race, reaching a qualification slot for UEFA Champions League or UEFA Europa League, and the fight against relegation.

Here, the attention must be directed toward the notion of competitive intensity (CI). The theory of CI is attributed to Kringstad and Gerrard [8] and is, therefore, a comparatively young construct. They defined CI as "the degree of competition within the league/tournament with regards to its prize structure" [8] (p. 120). However, a similar idea is already found in the considerations of Neale [51] regarding league standing effects (see also Andreff and Scelles [52]) and was referred to by Jennett [46] as "being in contention." The basic idea of CI is that all relevant sub-competitions in a league should be taken into account when analyzing its competitive structure, not just the championship race. Even though this has raised some scientific attention [53], the majority of studies including CI do not focus on it specifically. Usually, the different sub-competitions are understood as one element among others in a demand model. Table 2 gives an overview of studies that investigated at least two sub-competitions on a seasonal level in a European team sports league. Considering its importance for sports leagues, it is striking that only three studies could be identified that had the specific aim of developing a method to comprehensively measure CI (Kringstad and Gerrard [9]; Scelles et al. [53]; Wagner et al. [7]). As a CI measurement will be applied to the big five later on, these three methods are briefly introduced afterward and the choice of one of the three is explained.

Kringstad and Gerrard [9] developed an end-of-season measurement based on final standings and compared it with CB in the Premier League for the period from 1994/95 to 2003/04. A sum calculation including total points, a prize interval (10 points), and weights for the different prizes was established. The authors showed that, despite low CB, a high CI can be achieved. Due to the arbitrary weighting they introduced (1 for the championship,  $1/1.5^2$  for qualifying for CL,  $1/2^2$  for qualifying for EL, and  $1/3^2$  for relegation), the championship race had an enormous influence on the seasonal CI. Furthermore, Scelles et al. [53] noted that there is no apparent dynamic information concerning the course of the season.

Scelles et al. [53] developed the concept of intra-championship competitive intensity (ICCI), which consists of Intra-Championship Uncertainty (ICU) and Intra-Championship Fluctuations (ICF). The ICU provides information on the percentage of teams that have the theoretical chance to change their position regarding a sporting stake on the next two matchdays (6 points). It was measured for eight matchdays during the season. The ICF shows how many changes in standing have occurred during a season. The two metrics were applied to the French top-tier football and basketball leagues for the period from 2004 to 2009. It turned out that the indices for Pro A (basketball) surpassed those of Ligue 1 (football). With eight measurement points for the ICU, a dynamic measurement was introduced. But it has to be noted that the measured points and point intervals were chosen subjectively. The two indices were also not merged to give a comprehensive picture. Finally, it is not possible to deduce the contribution of the different sub-competitions to seasonal CI.

**Table 2.** Previous research on seasonal competitive intensity (CI) in European team sport, modified after Wagner et al. [7].

Author(s)	League(s)	Season(s) under Investigation	Sub-Competition (Variable)	Objective of Study
Jennett (1984) [46]	Scottish Football League	1975/76–1980/81	championship, relegation	explaining attendance
Cairns (1987) [48]	Scottish Football League	1971/72–1979/80	championship, relegation	influence of league structure on attendance
Dobson and Goddard (1992) [49]	English Football League (Div. 1–4)	1989/90–1990/91	championship/promotion	explaining standing and seated attendance
Baimbridge et al. (1996) [47]	English Premier League	1993/94	championship, relegation	influence of TV broadcasting on attendance
Kringstad and Gerrard (2005) [9]	English Premier League	1994/95–2003/04	championship, UEFA CL, UEFA CL qualifiers, UEFA Cup, relegation	introducing CI measurement, comparison CB and CI
Scelles et al. (2011) [53]	French Ligue 1 and basketball Pro A	2004–2009	Ligue 1: championship, UEFA CL, UEFA CL qualifiers, UEFA Cup, UI Cup, relegation Pro A: six later 13 (playoffs)	introducing ICCI model, optimizing league design
Pawlowski and Anders (2012) [54]	German Bundesliga	2005/06	championship, UEFA CL	explaining attendance
Scelles et al. (2013a, 2013b) [44,55], Andreff and Scelles (2015) [52], Scelles et al. (2016) [56]	French Ligue 1	2008–2011	championship, UEFA CL, UEFA CL qualifiers, UEFA EL, potential UEFA EL, potential UEFA EL qualifiers, relegation	explaining attendance
Buraimo and Simmons (2015) [57]	English Premier League	2000/01–2007/08	championship, qualification for UEFA CL or EL, relegation	explaining TV audience
Scelles (2017) [58]	English Premier League	2013/14	championship, UEFA CL, UEFA EL, potential UEFA EL, relegation	explaining TV audience
Bond and Addesa (2020, 2019) [11,59]	Italian Serie A	2012/13–2014/15	championship, UEFA CL, UEFA CL qualifiers, UEFA EL, UEFA EL qualifiers, relegation	explaining attendance (2020)/TV audience (2019)
Wagner et al. (2020) [7]	German Bundesliga	1996/97–2017/18	championship, UEFA CL (incl. qualifiers), UEFA EL (incl. qualifiers), avoid direct relegation	introducing CI-Index-Model, implications for league organizers

Wagner et al. [7] developed a CI-Index-Model that is based on a graphical analysis of the outcome of a league with different sub-competitions. Their CI-Diagram depicts an ex-post contention area for each sub-competition. The CI-Indices for the different sub-competitions are then calculated based on (i) specific surface areas in the diagram and (ii) the decision matchday for each sub-competition. The authors applied their model to 22 seasons (1995/96–2017/18) of the German Bundesliga. A decrease in the seasonal CI since the 2009/10 season was detected, which could mainly be attributed to a considerable

drop in CI of the championship race. It also became apparent that the qualification for EL was the sporting prize that constantly showed the highest CI if compared to the other sporting prizes. As it uses the final table as a basis, the method is not dynamic. However, it is the only method that gives a comprehensive overview of the contribution of different sub-competitions to the overall CI of a sports league. Furthermore, it is very flexible, can be applied to leagues with a different number of matchdays and/or sporting prizes, and determines an intuitively understandable theoretical maximum for each CI-Index. Due to these advantages, this model was used in the present study as the big five do not all encompass the same number of teams (which results in different numbers of matchdays), and it is of relevance to get an understanding of the competitive health not only of the entire league but also of the different sub-competitions.

#### 4. Materials and Methods

##### 4.1. Measurement of CI

The general aim of this study was a longitudinal and comparative analysis of competitive intensity (CI) in Europe's big five football leagues. This analysis was based on the numerical ex-post analysis of seasonal CI for sports leagues, as introduced by Wagner et al. (2020). The foundation of their CI-Index-Model is a CI-Diagram based on which CI-Indices for the sub-competitions of the respective sporting prizes are calculated. As an improvement to the original method, we simplified the CI-Diagram (Figure 3). This also led to a modification of the basic Equations (1)–(5), which, however, produced the same results. The four relevant sub-competitions in the top five leagues were: winning the championship (C), the qualification for the UEFA Champions League or its qualifiers (CL), the qualification for the UEFA Europa League or its qualifiers (EL) and avoiding direct relegation (adR).

As can be seen in Figure 3, the CI-Diagram is a quadratic coordinate system. The  $x$ -axis shows the matchdays in %, while the  $y$ -axis shows the points in %. The straight line  $\overline{SM}$  thus shows the progress of a team that wins every match and has reached 100% of the points (maximum score) at 100% of the matchdays (after the last matchday). The antipode to this is the straight line  $\overline{SZ}$  depicting that a team loses every match and, therefore, has zero points after the last matchday.

The points that depict the final league standings in the coordinate system are  $C_y$ ,  $CL_y$ ,  $EL_y$ , and  $adR_y$ , which are transferred from the final league table. Consequently,  $C_y$  is based on the points that the champion has gained after all matchdays.  $CL_y$  and  $EL_y$  result from the points that the last teams to qualify for the CL qualifiers and the EL qualifiers, respectively, have reached.  $adR_y$  refers to the number of points of the worst team that was not relegated directly. In other words, if a team has reached  $C_y$  or reached or passed  $CL_y$ ,  $EL_y$  or  $adR_y$ , it was successful in the respective sub-competition.

Based on points  $C_y$ ,  $CL_y$ ,  $EL_y$ , and  $adR_y$ , the parallelogram surface areas  $A_C$ ,  $A_{CL}$ ,  $A_{EL}$ , and  $A_{adR}$  can be calculated. The resulting area units are then multiplied by the squared matchday-ratio  $\left(\frac{dMD_x}{eMD}\right)^2$ . The matchday-ratio is based on the matchday on which a sub-competition was decided and is included to emphasize the relevance of the decision matchday for the competitive intensity of a sub-competition. If, for example, the championship of a league with 38 matches was decided on the 35th matchday, the area of  $A_C$  is multiplied by  $(35/38)^2$ . The later a competition is decided, the higher the matchday-ratio.

Overall, the following five equations for the CI-Indices result are

$$CI_C = A_C * \left(\frac{dMD_C}{eMD}\right)^2 = C_y * (100 - C_y) * \left(\frac{dMD_C}{eMD}\right)^2, \quad (1)$$

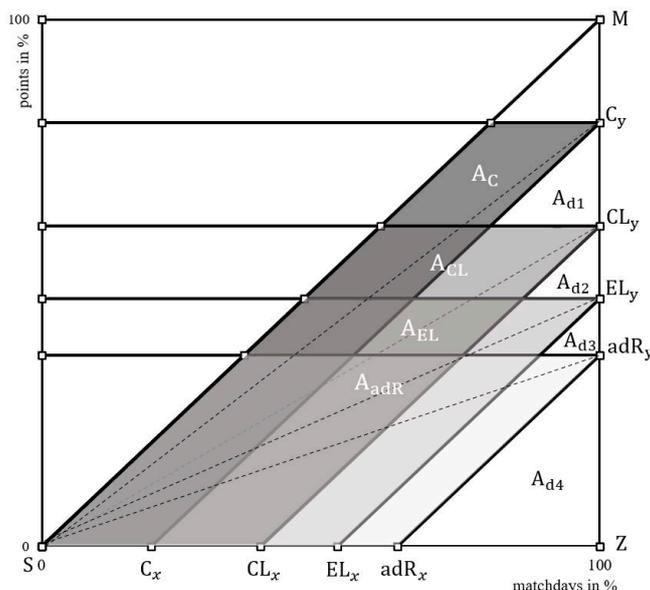
$$CI_{CL} = A_{CL} * \left(\frac{dMD_{CL}}{eMD}\right)^2 = CL_y * (100 - CL_y) * \left(\frac{dMD_{CL}}{eMD}\right)^2, \quad (2)$$

$$CI_{EL} = A_{EL} * \left(\frac{dMD_{EL}}{eMD}\right)^2 = EL_y * (100 - EL_y) * \left(\frac{dMD_{EL}}{eMD}\right)^2, \quad (3)$$

$$CI_{adR} = A_{adR} * \left( \frac{dMD_{adR}}{eMD} \right)^2 = adR_y * (100 - adR_y) * \left( \frac{dMD_{adR}}{eMD} \right)^2, \tag{4}$$

$$CI_{season} = CI_C + CI_{CL} + CI_{EL} + CI_{adR}. \tag{5}$$

Using these equations, a theoretical maximum for each CI-Index can be determined as follows: The largest surface area for all four sub-competitions arises when half of all points have been attained by all teams at the end of a season [coordinate point (100 | 50)]. This means that success in the different sub-competitions is, for instance, determined by scored goals or other performance criteria that are usually secondary to the points that are won. The corresponding parallelograms ( $A_C$ ,  $A_{CL}$ ,  $A_{EL}$ , and  $A_{adR}$ ) will all yield the theoretical maximum of 2500 area units as each deviation diminishes the corresponding surface area. As all sub-competitions are decided on the last matchday, the matchday-ratio will be 1 and all CI-Indices will have the value of 2500.  $CI_{season}$  will, therefore, be 10,000. By knowing these maxima, all calculated CI-Indices can be related to their theoretical maxima. It must be noted, though, that the sub-competitions are not independent of one another as each point won in the league competition is only awarded once. But these dependencies are hard to generalize because, for instance, in a league with 20 teams the total points that can be won range from 1140 (e.g., ten teams win every match) to 380 (each of the 380 matches ends in a draw). As the method was used in this paper, these interdependencies were not considered in the calculations. For an elaborate explanation of the method, see Wagner et al. [7].



**Figure 3.** CI-Diagram, modified after Wagner et al. [7]. Legend: S: start of season; M: theoretical maximum point total on last matchday; Z: zero points on last matchday;  $C_y$ : point total of champion;  $CL_y$ : point total of weakest team to qualify for Champions League (CL) qualifiers;  $EL_y$ : point total of weakest team to qualify for Europa League (EL) qualifiers;  $adR_y$ : point total by weakest team to avoid direct relegation;  $\overline{SM}$ : path of a team that would have won every match;  $\overline{SZ}$ : path of a team that would have lost every match;  $\overline{SC_y}$ : averaged path of champion;  $\overline{SCL_y}$ : averaged path of weakest team qualifying for CL qualifiers;  $\overline{SEL_y}$ : averaged path of weakest team qualifying for EL qualifiers;  $\overline{SadR_y}$ : averaged path of weakest team avoiding direct relegation;  $\overline{C_xC_y}$ : drop-out line championship race (also: boundary of  $A_C$  to  $A_{d1}$  and  $A_{CL}$ );  $\overline{CL_xCL_y}$ : drop-out line CL qualifiers (also: boundary of  $A_{CL}$  to  $A_{d2}$  and  $A_{EL}$ );  $\overline{EL_xEL_y}$ : drop-out line EL qualifiers (also: boundary of  $A_{EL}$  to  $A_{d3}$  and  $A_{adR}$ );  $\overline{adR_xadR_y}$ : drop-out line relegation (also: boundary of  $A_{adR}$  to  $A_{d4}$ );  $A_C$ : surface area of championship (C), in contention for championship;  $A_{CL}$ : surface area of CL, in contention for direct CL qualification or qualifiers;  $A_{EL}$ : surface area of EL, in contention for direct EL qualification or qualifiers;  $A_{adR}$ : surface area of avoiding direct relegation (adR), in contention for fight against relegation;  $A_{d1}$ : success zone qualification for CL qualifiers (or failure zone championship);  $A_{d2}$ : success zone EL qualifiers (or failure zone CL qualifiers);  $A_{d3}$ : success zone avoiding relegation (or failure zone qualification EL qualifiers);  $A_{d4}$ : failure zone avoiding relegation.

#### 4.2. Data Collection

The investigation period of our study covered the seasons between 1998/99 and 2018/19. 1998/99 was the first season when teams could qualify for the reformed UEFA CL and UEFA EL in their domestic leagues [50]. 2018/19 was the last season before the Corona pandemic broke out and fundamentally affected all professional football leagues in Europe. Overall, a sample of 102 seasons was included in the analysis as the Serie A (Italy) seasons for 2004/05, 2005/06, and 2006/07 had to be excluded because their final tables were modified due to match-fixing [60].

In the investigation period, La Liga (Spain) and Premier League (England) continuously comprised 20 teams, while 18 teams played in the Bundesliga (Germany) over the entire period. Serie A (Italy) changed from 18 to 20 teams in 2004/05; the same was the case for Ligue 1 (France) in 2002/03.

The number of teams qualifying for UEFA competitions depends on the UEFA's country coefficient, resulting from a five-year assessment. Consequently, the number of slots that are assigned to a specific league and the required position in the leagues' final tables to qualify for one of UEFA's competitions varies. It is dependent on the success of the league's clubs in the European competitions in the past. An additional qualifying opportunity for the UEFA Cup (which preceded the Europa League) was a pre-season tournament called the UEFA Intertoto Cup (UI Cup), which was founded in 1961 but was discontinued after the 2008 tournament. Additional participation opportunities have also been awarded via the UEFA Respect Fair Play ranking since 2015/16. But the following analyses do not take the UI Cup and the Fair Play ranking into account because it would be detrimental to the comparability of the results for the different seasons and leagues.

The final tables of each league and season are used to gather information on the number of points needed (a) to win the championship, to qualify for (b) the UEFA CL qualifiers, and (c) the UEFA EL qualifiers or (d) to avoid direct relegation. This general prize structure is the same for each of the five leagues. But the number of teams eligible for participation in European competitions (see above) and the number of teams that are relegated differ between the leagues.

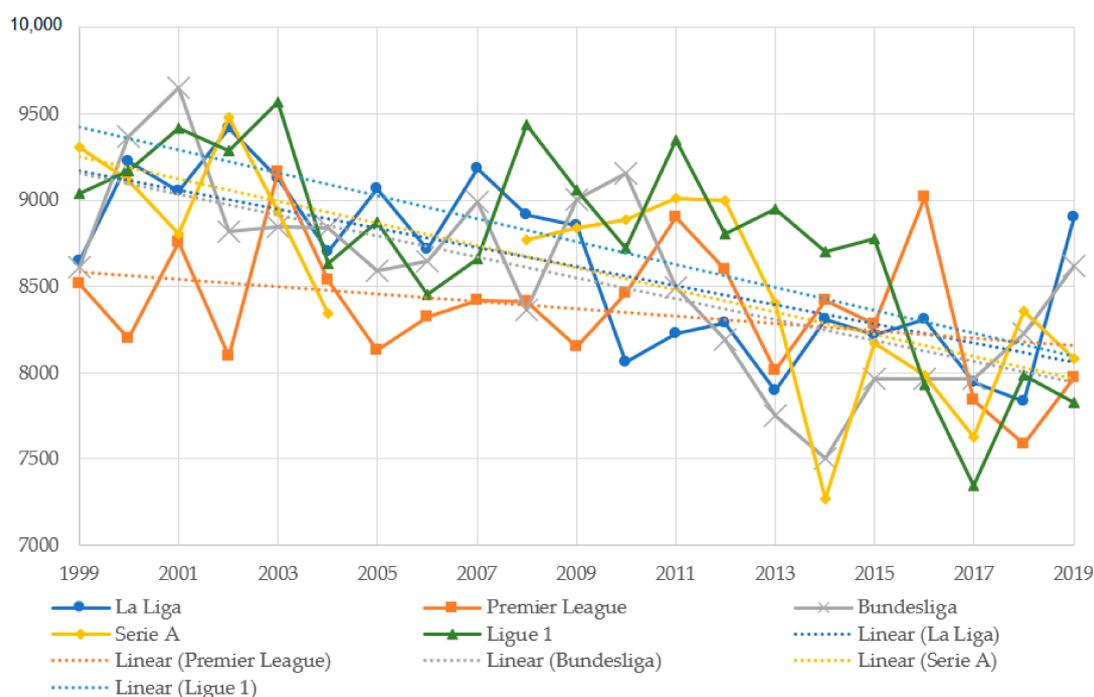
Table A1 (Appendix A) contains an overview of the positions in the final table that secured success in the different sub-competitions. Position 1 for winning the championship is not listed as it is self-explanatory. The total points necessary to secure the rankings mentioned in the table were used for the calculation. Furthermore, decision matchdays (dMDs) for each sub-competition were determined (Table A2). Decisive for the dMD was the moment when the team or all the teams in a position associated with success in a sub-competition have secured this success. Changes within a sub-competition were not taken into account (e.g., if the second- and third-place teams changed their slots in the table after the dMD but still both qualified for the same European competition). The required data were obtained from the official websites of the leagues.

## 5. Results

Employing Equations (1)–(5), the CI for the mentioned 21 big five seasons were calculated (Table A3). Figure 4 presents an overview of the seasonal CI-Indices of the five leagues during the investigation period. As can be seen, all seasonal CI-Indices were in a corridor above 7000. The index value of 9500 was only exceeded twice, by the Bundesliga in 2000/01 and by Ligue 1 in 2002/03. Until 2011/12, all indices were above 8000. Since then, they have frequently fallen below this level. The Premier League's 2013/14 season and Ligue 1's 2016/17 season were the only ones below 7500. Overall, a decrease of seasonal CI can be observed in all leagues by looking at the respective linear trend lines in Figure 4. The Premier League stands out with a distinctly lower negative gradient, but it also stands out because it starts with a considerably lower CI than the other leagues in 1998/99.

Apart from seasonal CI for each season of each of the big five (column  $CI_{\text{season}}$ ), the contribution of the respective sub-competitions is shown in Table A3. Moreover, the results on average ( $\emptyset$ ) for seasonal CI-Indices are summarized. As can be seen in Table A3, Ligue

1 reached the highest seasonal average with a mean CI-Index of 8760.3, followed by La Liga with 8613.4, Serie A with 8576.6, the Bundesliga with 8550.1, and the Premier League showing the lowest mean of 8370.7 to complete the picture. In all leagues, the ranking of the sub-competitions was identical in terms of the contribution to  $CI_{\text{season}}$ . With around 28%, the EL had the largest share for all leagues. It was followed by the CL with 26.3–27.3% and the sub-competition adR with around 26%. In all leagues, the championship race was the sub-competition that contributed least to the seasonal CI with a share between 18.6–20.3%.



**Figure 4.** Comparison of seasonal CI-Index progression from 1999 to 2019 of the big five.

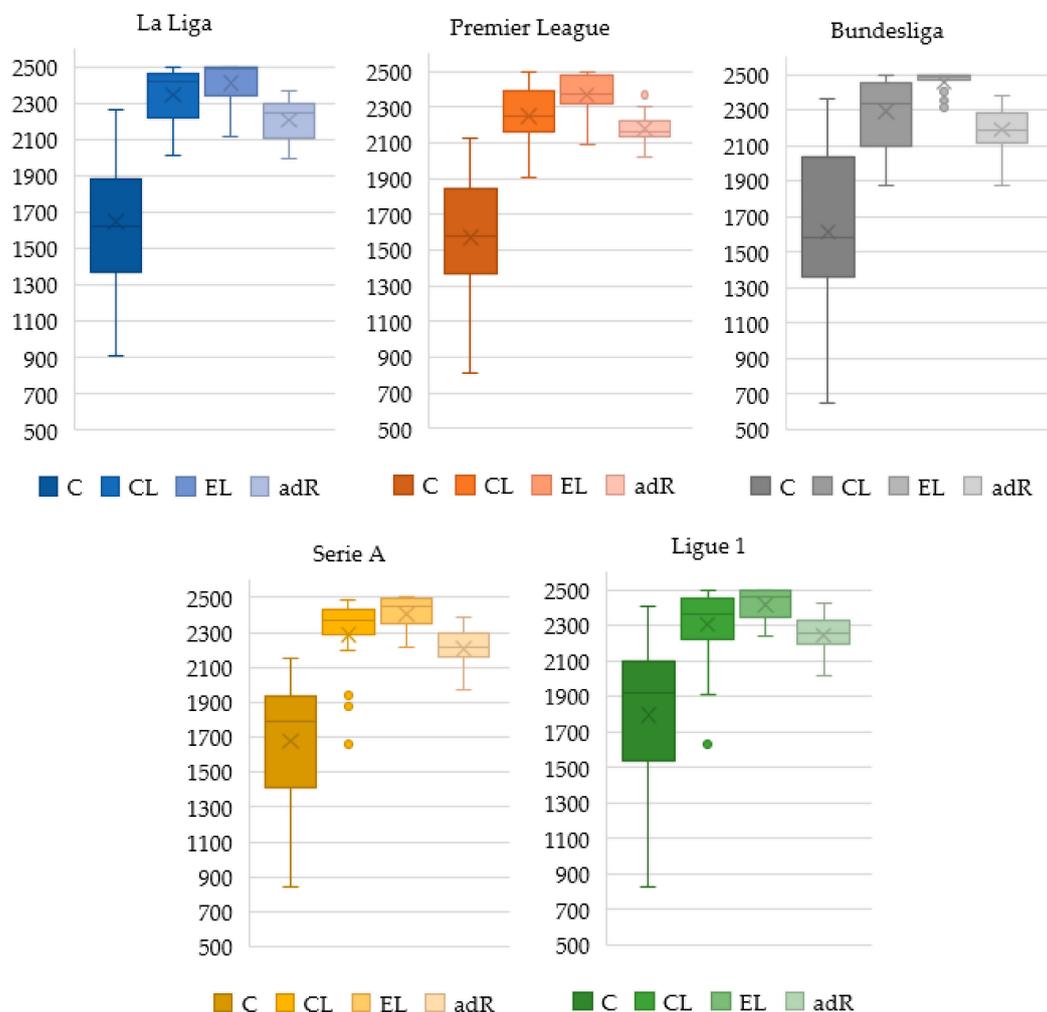
The comparison of average indices of the last decade (2009/10–2018/19) with those of the 11 seasons before (1998/99–2008/09) clearly shows that there was a decrease in seasonal CI (Table 3). In the Premier League, the difference was only 117.5 index points, while in Ligue 1 it was 615.8, in Serie A it was 669.5, and in the Bundesliga 701.0. The most substantial change of 791.7 was found for La Liga. Furthermore, Table 3 shows the minimum and maximum values (taken from Table A3) of the seasonal CI-Index for the big five. The Bundesliga achieved the highest index (9649.2) of all 102 seasons in 2000/01, and the lowest index (7268.0) was found for Serie A in 2013/14. It is striking that the maximum indices were generated toward the beginning of the period under scrutiny between 2000/01 and 2002/03 in all five leagues, while the respective minimum indices were found for seasons between 2013/14 and 2017/18.

A closer inspection of the sub-competitions, with a focus on similarities between the leagues, is shown in Figure 5. For all leagues, the mean index of the sub-competition EL was closest to the theoretical maximum of 2500. For this competition, the Bundesliga had the highest mean CI-Index with 2455.9, while the Premier League had the lowest with 2369.6. The sub-competition CL was the competition with the second-highest average CI-Index of all the leagues. Here, La Liga reached the highest CI-Index with 2345.6 and the Premier League had the lowest (2250.5). Furthermore, the competition adR uniformly gained the third-highest average value. The highest mean was generated in Ligue 1 (2244.4), whereas the lowest mean was seen in Premier League (2180.2). As shown in Table A3, the championship race provided the smallest contribution to overall CI. The mean indices of this sub-competition were far below those of the others. The highest mean index was again

reached by Ligue 1 (1795.1), while the Premier League had the lowest index (1570.4), which also constituted the lowest mean for any of the sub-competitions under scrutiny.

**Table 3.** Average seasonal CI-Index until 2008/09 and from 2009/10—top and flop seasons.

	$\bar{\text{CI}}_{\text{season}}$ 1998/99–2008/09	$\bar{\text{CI}}_{\text{season}}$ 2009/10–2018/19	Max. $\text{CI}_{\text{season}}$		Min. $\text{CI}_{\text{season}}$	
La Liga	8990.4	8198.7	9416.0	2001/02	7834.0	2017/18
Premier League	8426.6	8309.2	9163.1	2002/03	7587.4	2017/18
Bundesliga	8883.9	8183.0	9649.2	2000/01	7501.0	2013/14
Serie A	8948.5	8279.0	9480.0	2001/02	7268.0	2013/14
Ligue 1	9053.5	8437.7	9570.6	2002/03	7347.9	2016/17



**Figure 5.** Box plot corresponding to the sub-competitions: championship (C), Champions League (CL), Europa League (EL), and avoiding direct relegation (adR) from 1998/99–2018/19. Notes: Mean = X, median = horizontal line in the square, outlier = points, according to the honestly significant difference (HSD) of Tukey (1977) the whisker length is limited to a maximum of 1,5 times the interquartile range ( $1,5 \cdot \text{IQR}$ ). The outliers are included in the calculation of the mean values.

In Figure 5 it is striking that the CI-Indices of the championship race show a much wider range and much lower average values than the other sub-competitions. Based on Figure 5 and Table A3 it can be stated that a decline in  $\text{CI}_C$  can be considered the main

reason for the overall decline of seasonal CI visible in Figure 4, as the sub-competitions CL, EL, and adR produced relatively constant indices over the years.

## 6. Discussion

To our knowledge, this study is the first scientific work that has looked at professional European football as an entrepreneurial ecosystem. Against this backdrop, the precise research interest was motivated by a general research question that Cavallo et al. put forward, namely, “How is the EE’s sustainability ensured?” [4] (p. 1312). Due to their central relevance for the EE of professional European football, the big five were the focus of this study because they are considered a major driver for the past and future development of professional European football and the EE in which it is embedded. To a large extent, this relevance is nourished by and dependent on the sustainability of the sporting competition in the big five. Accordingly, the coordinating body of Germany’s Bundesliga, the “Deutsche Fußball Liga GmbH” (DFL), for instance, considers “offering a high-calibre competition” [61] one of the major goals of their global growth strategy.

In this study, the sustainability of the sporting competition in the big five was analyzed using competitive intensity (CI) as an indicator. More specifically, the CI-Index-Model of Wagner et al. [7] was used because it does not only look at overall CI (for the entire league) but also at the CI in the four most relevant sub-competitions (championship, qualification for Champions and Europa League, fight against relegation). The examination period started with the season 1998/99 because the current structure of the European club competitions basically dates back to that season and ended with the last full season before the outbreak of the Corona pandemic, 2018/19.

Regarding the CI-Index-Model, three limitations were accepted. First, no differentiation was made between direct qualification for CL and EL and the qualification for the qualifiers for these competitions. This means that some of the teams that were taken into account have to first successfully participate in a qualification round on the European level before they can participate in CL or EL. Second, the sub-competitions were not weighted according to their attractiveness [9,56,58,62] but based on the decision matchday. This means that the weighting that was used was directly related to the respective sub-competition and presented a comparison without distortions. Third, the ex-post perspective of the model did not consider the dynamics during a season. But considering that it is inherent to the league structure that the sub-competitions are only decided at the end of the season, limitations two and three were not considered to be problematic per se. But it must be pointed out that other decisions could have been made that could then have led to different outcomes.

Regarding the question whether the similar league structure with a round-robin format, equal points systems, and four fundamentally distinct sporting prizes provided a robust competition before the Corona pandemic, it is striking that the sub-competitions in all leagues showed very similar contributions to seasonal CI ( $CI_C$ : 18.8–20.3%,  $CI_{CL}$ : 26.3–27.3%,  $CI_{EL}$ : 27.7–28.8%,  $CI_{adR}$ : 25.7–26.1%). But it has to be mentioned that the most prominent sub-competition, the championship race, has shown declining CI-Indices over the past 10 seasons as dominant teams have often become champions rather early. In addition, only a very small number of teams won titles in the big five over the last 10 seasons, as has been shown in the introduction. Due to the decreasing  $CI_C$ , seasonal CI was also lower in the past 10 years in all leagues than in the 11 seasons before.

Nevertheless, it also must be mentioned that the enormous spectator interest in the big five had not reached a tipping point until 2019, which was seen by the continuous economic growth of the leagues [22]. This indicated that the level of CI still seemed to be perceived as sufficiently high. Star player effects [57], David vs. Goliath attraction [63], and the “post-championship glory factor” [46] (p. 182) probably made up for declining CI in the championship race. This means that at least until 2019, the big five’s prominent role should have strengthened the entrepreneurial ecosystem of professional European football.

But due to the prominence of the championship race, the mentioned results should alert league managers and others concerned with the sustainability of the (entrepreneurial) ecosystem of professional European football. From the perspective of sustaining the CI of the championship races, in the long run, nourishing at least one (or better, two) somewhat equally strong opponents for the dominating teams seems advisable. In this context, one of the possible reasons for the development of the championship races in the big five has to be addressed: While the Champions League's prize money has increased by 321% between 2003 and 2017, only a limited number of teams directly profit from this increase [64], and those teams frequently are among the dominant teams in their leagues or even serial champions. Dowling et al. [65] also found evidence for a financial imbalance in the big five and confirmed the connection with sporting success. Moreover, the introduction of the UEFA Financial Fair Play regulation further facilitated the dominance of the strong teams [5,27,66]. These factors should be taken into account when European football re-establishes itself after the Corona pandemic, e.g., by adjusting the prize money structure of the European competitions. Attractive and somewhat balanced sub-competitions cannot be regulated at the national level alone, hence there must also be a call to UEFA to regulate supranational football.

In terms of the sustainability of the sporting competition in the big five, the results of this study support the idea of a society with four classes [7] that should secure high CI-Indices for all relevant sub-competitions. In line with this, Scelles et al. [56] recommended a shift from a global to a local competitive balance for increasing CI. If this were achieved in the long run, balanced rivalries within the sub-competitions should result. In the CI-Index-Model, this should have the effect that teams in the same contention area ( $A_C$ ,  $A_{CL}$ ,  $A_{EL}$ , and  $A_{adR}$ ) would be rather close to the average path throughout the season.

Further managerial implications can be derived from the fact that the sub-competition EL consistently showed the largest contribution to seasonal CI for all leagues. Therefore, this competition is particularly important for the domestic leagues' attractiveness, which should also be mirrored in league management and governance. Moreover, domestic leagues should use their influence on UEFA to ensure that the competition remains as attractive as possible for clubs and supporters (e.g., prize money, kick-off times, etc.) as some team managers have already stated that they would be better off by not qualifying for the EL [67].

In this context, it is also assumed that the third European competition (UEFA Europa Conference League), which is currently scheduled to start in 2021, must be seen very critically in sporting terms, even though it will certainly create new entrepreneurial opportunities for some actors in the EE under scrutiny. In the CI-Index-Model, adding another competition will most likely have a numerically positive effect on seasonal CI, and the theoretical maximum for seasonal CI will climb to 12,500. As clubs will need about 50% of the total points to qualify for this new competition, the corresponding contention area ( $A_{ECL}$ ) is expected to be very close to the theoretical maximum of 2500 in the CI-Diagram. Furthermore, it is expected that the decision matchday-ratio will be rather high. This means that the  $CI_{ECL}$ -Index will almost certainly have a high value. However, it must be ensured that this additional sporting prize is attractive in terms of revenues, media attractiveness, reputation, and spectator demand so that it will be understood as a "prize" rather than a burden [7]. If this were not achieved, negative effects could result (not only, but certainly) for competitive intensity if teams felt obliged to aim at avoiding qualification because of the rather negative ramifications of participation in the competition. At least, in the long run, this could turn out to be problematic for European football and could have very detrimental effects on the EE in which it is embedded. This means that this development should be closely monitored from a practical as well as from a scientific perspective.

Another avenue for further research is a stronger focus on CI and its importance for sports competitions and the EE in which they are embedded. As has been outlined in the literature review, CI is a more relevant construct than competitive balance for

European football leagues if the sustainability of the sporting competition as such is of interest. A possible next step when analyzing CI in Europe's professional football can be the investigation of seasonal CI in leagues with fewer qualification slots for UEFA's supranational competitions. Moreover, modifications of the model are very relevant research endeavors. For instance, the differentiation of the sub-competitions CL and EL into direct qualification and indirect qualification could give a more differentiated picture, even though we decided against this differentiation in our study. Furthermore, various structural aspects can be examined (German 50 + 1 regulation vs. "sugar daddy" regulation, different structures of national cup competitions, introduction of the UEFA Financial Fair Play regulations, etc.). Finally, the CI-Index-Model can be used for demand studies, and supporters' perception of CI would be a promising new field of research. Supporters are among the most crucial stakeholders for a league and their opinions should be a pillar of strategy development and league governance [68]. This is particularly true as far as the sustainability of the EE of professional European football is concerned because eventually this EE's potential is rooted in the attractiveness of the competition for supporters, spectators, fans, and many other stakeholder groups. Developing and empirically testing weightings for the different sub-competitions (that can, for instance, be based on spectators' perception of their importance) would also be of relevance in this regard, which is especially true as such weightings can then refine the CI-Index-Model used in this study.

The final remarks of this paper are devoted to European football as an EE. Due to the very specific structure of the entrepreneurial ecosystem of professional European football, a large potential for future research can be identified. First of all, it seems promising to scrutinize which actors and factors in this EE are the most relevant for fostering entrepreneurial activity. One promising idea is the analysis of newcomers that have reached professional football through promotion from amateur levels, thus opening up new markets by their sporting success, which will almost certainly be accompanied by intensive entrepreneurial activity. But also established clubs are constantly striving to get a competitive edge over their competitors, which does not only manifest on the pitch but also in new or adapted goods and services that are frequently provided by entrepreneurs outside of the organizations. Examples are new ways of marketing stadium capacities during matches and also when stadiums are not in use for football competitions, new ways of catering to spectators at home matches to increase spending per person (e.g., by implementing virtual solutions), or new products and services that can also be consumed apart from football competitions, for which new eSports departments would be but one example. Even the central actor in European football, the Union of European Football Associations (UEFA), shows and fosters entrepreneurial spirit by constantly looking for ways to offer new products or services or to find innovative solutions to raise the attractiveness of the competitions for which it holds the rights (European club competitions and European championship tournaments). Examples are the decision to play the EURO 2020 (which was postponed to 2021 due to the Corona pandemic) in 12 different countries or the introduction of the UEFA Europa Conference League that has already been discussed above.

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## Appendix A

Table A1. Position in final table to be successful in terms of a specific sub-competition.

	La Liga			Premier League			Bundesliga			Serie A			Ligue 1		
	CL	EL	adR	CL	EL	adR	CL	EL	adR	CL	EL	adR	CL	EL	adR
2018/19	4	7	17	4	7	17	4	7	16	4	7	17	3	4	18
2017/18	4	7	17	4	7	17	4	6	16	4	7	17	3	6	18
2016/17	4	7	17	4	7	17	4	7	16	3	6	17	3	6	18
2015/16	4	6	17	4	7	17	4	7	16	3	6	17	3	6	17
2014/15	4	7	18	4	7	17	4	7	16	3	7	17	3	6	17
2013/14	4	7	17	4	6	17	4	7	16	3	7	17	3	5	17
2012/13	4	9	17	4	5	17	4	6	16	3	5	17	3	5	17
2011/12	4	6	17	3	5	17	4	7	16	3	6	17	3	5	17
2010/11	4	7	17	4	5	17	3	5	16	4	6	17	3	6	17
2009/10	4	7	17	4	7	17	3	6	16	4	7	17	3	5	17
2008/09	4	6	17	4	8	17	3	5	16	4	7	17	3	5	17
2007/08	4	6	17	4	5	17	3	5	15	4	7	17	3	5	17
2006/07	4	6	17	4	7	17	3	5	15	-	-	-	3	4	17
2005/06	4	6	17	4	6	17	3	5	15	-	-	-	3	4	17
2004/05	4	6	17	4	7	17	3	6	15	-	-	-	3	4	17
2003/04	4	6	17	4	5	17	3	5	15	4	7	15	3	5	17
2002/03	4	6	17	4	6	17	3	5	15	4	6	15	3	5	17
2001/02	4	7	17	4	6	17	3	6	15	4	6	14	3	4	16
2000/01	4	6	17	3	6	17	4	6	15	4	6	15	3	5	15
1999/00	3	6	17	3	5	17	4	6	15	4	7	14	3	4	15
1998/99	4	6	18	3	4	17	4	6	15	4	9	14	3	7	15
Ø	4.0	6.5	17.1	3.8	6.1	17.0	3.5	6.0	15.5	3.7	6.6	16.2	3.0	5.0	16.8

Table A2. Averaged decision matchdays in all sub-competitions between 1998/99 and 2018/19.

	La Liga				Premier League				Bundesliga				Serie A				Ligue 1			
	C	CL	EL	adR	C	CL	EL	adR	C	CL	EL	adR	C	CL	EL	adR	C	CL	EL	adR
2018/19	36	38	38	38	38	38	37	37	34	34	34	33	33	38	36	38	33	37	37	38
2017/18	35	36	38	35	33	38	37	38	29	34	34	34	37	38	38	38	33	38	38	38
2016/17	38	37	36	37	36	38	35	37	31	31	34	33	37	36	37	38	37	33	36	38
2015/16	38	37	35	38	36	38	38	38	33	33	33	33	35	36	38	38	30	38	37	38
2014/15	37	38	38	38	34	37	37	38	30	30	34	34	34	38	37	36	37	38	37	37
2013/14	38	36	36	38	38	37	38	38	27	34	34	34	36	36	38	37	36	38	38	38
2012/13	35	38	38	37	34	38	37	37	28	34	34	34	35	38	38	37	36	38	38	38
2011/12	36	38	38	38	38	38	37	38	32	33	33	34	37	38	37	38	38	36	38	38
2010/11	37	36	37	38	37	36	38	38	32	33	33	34	37	38	38	37	37	38	37	38
2009/10	38	38	37	37	38	37	37	37	34	34	34	34	38	38	36	37	36	38	38	36
2008/09	36	38	38	38	37	35	38	38	34	34	34	34	36	38	38	38	38	37	38	38
2007/08	35	38	38	38	38	36	38	38	31	32	34	34	38	38	36	38	38	38	38	38
2006/07	38	36	38	38	36	36	38	38	34	32	34	34	-	-	-	-	33	38	38	36
2005/06	36	38	37	37	36	38	37	37	33	33	34	34	-	-	-	-	33	38	38	36
2004/05	37	38	38	38	35	37	38	38	31	34	34	33	-	-	-	-	35	36	38	38
2003/04	36	35	38	37	35	38	38	37	32	34	34	34	32	34	33	34	38	35	37	38
2002/03	38	37	38	36	37	38	38	38	30	34	34	34	32	33	34	34	38	38	38	38
2001/02	37	38	38	38	36	36	35	38	34	33	34	33	34	34	34	34	34	34	33	34
2000/01	36	38	38	37	34	38	38	37	34	34	34	34	34	32	33	34	33	34	34	34
1999/00	37	38	36	37	34	38	37	38	34	34	34	34	34	33	34	33	31	34	33	34
1998/99	35	38	37	37	38	35	36	38	31	34	33	34	34	33	34	34	34	34	33	34
Ø DM after 38 MDs	36.6	37.3	37.4	37.4	36.1	37.1	37.2	37.7					36.1	37.5	37.3	37.5	35.6	37.2	37.6	37.6
Ø DM after 34 MDs									31.8	33.2	33.8	33.8	33.3	33.2	33.7	33.8	33.0	34.0	33.3	34.0
Ø DM in %	96.4	98.2	98.4	98.4	95	97.7	98	99.1	93.6	97.8	99.4	99.3	96.0	98.3	98.4	99.0	94.4	98.2	98.7	99.1

Notes: La Liga and Premier League are permanently with 20 teams, Bundesliga is permanently with 18 teams; Serie A is with 18 teams until 2003/04, then with 20 teams; Ligue 1 is with 18 teams until 2001/02, then with 20 teams.

Table A3. Overall results regarding CI<sub>season</sub> and contribution of sub-competition.

	La Liga				Premier League				Bundesliga				Serie A				Ligue 1								
	C	CL	EL	adR	C	CL	EL	adR	C	CL	EL	adR	C	CL	EL	adR	C	CL	EL	adR					
	CI <sub>season</sub>	contribution in %			CI <sub>season</sub>	contribution in %			CI <sub>season</sub>	contribution in %			CI <sub>season</sub>	contribution in %			CI <sub>season</sub>	contribution in %							
2018/19	8900.6	18.2	27.9	27.9	25.9	7974.3	15.1	29.5	29.7	25.7	8619.7	20.9	28.5	28.9	21.8	8083.8	15.5	29.6	27.4	27.5	7824.6	15.5	28.2	29.5	26.7
2017/18	7834.0	16.3	26.4	31.9	25.4	7587.4	10.7	29.7	31.2	28.5	8226.6	12.9	30.2	30.3	26.6	8358.9	15.8	27.8	29.8	26.6	7983.1	14.2	27.1	31.3	27.5
2016/17	7944.8	18.9	27.8	27.9	25.4	7840.7	17.2	28.3	26.9	27.5	7961.0	16.5	24.9	31.3	27.4	7626.7	20.0	21.8	30.7	27.4	7347.9	17.9	22.2	30.5	29.4
2015/16	8310.6	19.4	28.1	25.4	27.1	9015.1	20.5	27.0	27.5	25.0	7961.7	14.0	29.4	29.6	27.0	7983.1	17.1	23.5	31.2	28.2	7926.5	10.5	30.9	29.9	28.7
2014/15	8218.2	16.7	27.0	30.4	25.9	8279.7	17.5	27.1	28.5	26.8	7961.1	17.1	23.5	31.1	28.3	8170.9	17.7	29.2	29.0	24.1	8776.1	21.4	26.8	26.7	25.1
2013/14	8307.7	20.0	25.6	27.0	27.4	8419.8	22.0	24.0	28.4	25.7	7501.0	8.7	32.0	33.3	25.9	7268.0	11.6	26.7	34.4	27.3	8700.3	17.7	27.0	28.6	26.7
2012/13	7892.2	11.6	30.9	31.2	26.3	8013.4	17.1	28.7	27.5	26.6	7752.7	8.4	32.0	32.2	27.3	8404.7	18.2	27.7	29.0	25.1	8949.9	19.9	27.1	27.6	25.4
2011/12	8289.9	11.7	30.1	30.1	28.1	8597.7	19.9	27.6	27.0	25.5	8192.5	17.7	27.9	28.6	25.8	8996.9	20.4	27.4	26.3	25.9	8801.6	22.9	23.2	28.3	25.6
2010/11	8226.5	15.3	27.1	28.8	28.8	8902.8	22.3	24.3	27.9	25.6	8496.2	20.3	25.6	27.2	26.9	9007.6	21.3	27.1	27.4	24.2	9345.4	22.5	26.3	25.4	25.8
2009/10	8062.7	14.2	30.7	29.4	25.8	8460.7	21.9	26.6	27.7	23.8	9157.1	23.5	26.3	27.1	23.1	8889.2	22.7	27.3	25.2	24.8	8721.8	22.2	26.9	27.4	23.4
2008/09	8852.9	18.3	27.4	28.0	26.3	8149.6	19.3	24.2	30.3	26.1	9006.2	24.3	26.0	26.7	23.1	8838.7	19.7	27.2	28.3	24.8	9060.0	23.1	24.6	27.2	25.1
2007/08	8913.6	18.1	27.6	28.0	26.4	8413.4	21.5	23.7	29.1	25.7	8363.1	18.9	24.8	29.8	26.6	8770.4	21.6	27.8	25.6	25.0	9434.4	22.6	26.3	26.5	24.7
2006/07	9180.7	24.2	23.8	27.2	24.8	8418.2	18.3	25.7	29.7	26.4	8987.6	24.0	22.5	27.8	25.7	-	-	-	-	-	8658.8	17.9	28.9	28.9	24.3
2005/06	8712.8	20.8	27.6	26.8	24.8	8319.2	17.4	29.1	28.2	25.3	8648.2	21.2	24.2	28.9	25.7	-	-	-	-	-	8456.2	17.3	29.3	29.5	23.9
2004/05	9062.9	20.3	27.4	27.5	24.8	8126.6	14.5	29.0	30.7	25.8	8593.4	17.9	28.4	28.7	25.0	-	-	-	-	-	8869.9	20.3	25.0	28.2	26.5
2003/04	8702.1	22.6	23.1	28.7	25.6	8536.1	16.5	29.2	29.3	25.0	8835.5	20.0	26.2	28.0	25.8	8342.0	16.7	29.2	28.2	25.8	8631.5	24.6	22.1	27.2	26.1
2002/03	9126.8	23.7	25.8	27.4	23.1	9163.1	20.5	26.4	27.2	25.9	8843.3	17.1	27.7	28.2	27.0	8934.4	20.6	25.5	27.7	26.2	9570.6	25.1	25.6	25.7	23.5
2001/02	9416.0	22.7	26.2	26.5	24.7	8097.1	20.0	26.0	25.8	28.1	8815.8	24.4	23.7	28.1	23.7	9480.0	22.3	26.2	26.3	25.1	9286.9	24.6	26.3	24.9	24.3
2000/01	9053.7	20.7	27.3	27.6	24.4	8758.4	19.1	27.3	28.4	25.2	9649.2	24.5	25.6	25.7	24.2	8802.7	22.1	24.9	26.7	26.3	9414.6	22.2	25.9	26.5	25.3
1999/00	9225.2	24.6	26.7	24.2	24.6	8196.5	15.7	29.6	28.3	26.4	9367.6	21.7	26.6	26.7	25.0	9111.6	22.8	25.4	27.4	24.4	9166.7	21.0	27.0	25.6	26.4
1998/99	8648.0	20.9	28.3	27.1	23.7	8514.6	25.0	22.4	25.5	27.0	8613.4	17.4	28.6	27.2	26.8	9308.1	23.1	25.1	26.4	25.4	9038.6	23.0	26.1	26.0	24.9
Ø	8613.4	19.0	27.3	28.0	25.7	8370.7	18.7	26.9	28.3	26.1	8550.1	18.6	26.9	28.8	25.7	8576.5	19.4	26.6	28.2	25.8	8760.3	20.3	26.3	27.7	25.7
sd	492.3					414.9					580.5					588.6					584.6				

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