

The influence of the domestic league design on football clubs' international competitiveness

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ABSTRACT

Objective: The objective of this article is to examine whether the design of a national league affects the sports performance of clubs in UEFA international competitions.

Research Design & Methods: We conducted regression analyses of data on the sport performance of football clubs in UEFA competitions over five years. We analysed a total of 260 observations and explained the variability of points earned in UEFA competitions by the format and calendar of domestic league competitions. We also considered control variables, including league revenues, concentration ratios, and time.

Findings: All seven estimated models demonstrated a good fit for the empirical data (adj. $R^2 > 0.80$). However, we found that neither the domestic league format nor the season calendar (winter or summer) applied by the league were significant in the models. Noteworthy, revenues per club in the league were the primary explanatory factor for international sports performance, while concentration ratios had a positive but minor effect.

Implications & Recommendations: The study provides football league governing bodies with insights that suggest league design should not be seen as a direct means for enhancing clubs' achievements in international competition. Moreover, it demonstrates that maximizing competition attractiveness through modifications in league design does not necessarily entail a trade-off with maximizing international performance.

Contribution & Value Added: We employed league design as a specific aspect of the home country's institutional framework and contributed to the institutional-based view of international competitiveness. Our study illustrates that the institutional organization of domestic competition does not significantly impact actors' competitiveness abroad.

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INTRODUCTION

According to Terrien and Andreff (2020), the governing bodies of football leagues aim to maximise four main objectives, *i.e.* the uncertainty of league game outcomes, the stock of talent within the league, clubs' financial stability, and the international competitiveness of the league's clubs. Although leagues can influence these goals, they face the challenge of trade-offs. For instance, if league managers prioritize the international competitiveness of clubs by increasing the shares of the best teams when dividing TV broadcasting revenues, this could reduce the uncertainty of domestic results. However, some instruments that affect the outcomes' uncertainty — such as the format of league competitions — may appear neutral towards other goals. The question is whether this is indeed the case, *i.e.* does the format of league competition affect clubs' international competitiveness?

Currently, 52 out of 54 national football leagues in Europe use eight different competition designs based on a round-robin system (UEFA Intelligence Centre, 2022). The two exceptions are Liechtenstein, which does not organize a league competition and the closed league of San Marino. San Marino is

considered fundamentally different from other European football league designs, because it does not employ the promotion-relegation system, unlike most other leagues. For the remaining leagues, two criteria distinguish round-robin formats in European domestic competitions: the number of rounds and the traditional versus split format. The number of rounds varies from two to four, with 33% of all leagues splitting the table at some point during the season, leading clubs to compete against a select number of rivals based on their previous performance. The most popular format is the double round, in which each team plays one home and one away game against every rival. In total, 17 leagues apply this format, including all representatives of the top five leagues, also known as the TOP5. It is followed by the triple round (used by five leagues), quadruple round (used by 13 leagues), and various split options (such as two-plus-one, two-plus-two, three-plus-one, or one-plus-two). Moreover, each league competition may start in winter (in most cases) or summer (in 11 cases).

The issue of tournament design has been a subject of discussion in sports management and sports economics literature. As reviewed by Guajardo and Krumer (2023), researchers have investigated various tournament designs to examine possibilities of collusion, incentives for teams to lose, optimal scheduling, seeding, tie-breaking rules, the number of prizes, and the number of teams in the tournament. However, limited attention has been given to the relationship between tournament design and sports performance. Under certain conditions, evidence supports that the domestic and international competitiveness of clubs are correlated to some extent (Cabras *et al.*, 2022). Thus, this study aimed to examine whether the design of a national league affects the sport performance of clubs in UEFA international competitions.

The study contributes to the institution-based view of firms' international competitiveness (Peng, *et al.*, 2009). In essence, institutions serve as fundamental frameworks that influence the behaviour and conduct of organizations, reflecting what North (1990) describes as the 'rules of the game.' When applied in the field of strategic management and the exploration of firms' competitiveness (Polowczyk, 2011), institutional competitive advantage describes a scenario in which a company implements a strategy incorporating unique resources and activities made possible through its engagement with the institutional environment (Martin, 2014). This results in the creation of economic value that surpasses that of its competitors. Drawing upon the body of knowledge in sports management, we recognized the pivotal role of human resources in the sporting performance achieved by sports clubs (Garcia-del-Barrio & Szymanski, 2009; Gasparetto & Barajas, 2018), with scheduling being a significant factor influencing their performance (Cabras *et al.*, 2022; Krumer, 2021). Therefore, the football industry offers a unique laboratory to investigate whether the manner in which formal institutions establish the rules of competition among agents domestically (in the form of league design) impacts their competitiveness on an international stage (in terms of sports performance).

Furthermore, this study provides practical implications for sports governing bodies by demonstrating whether decisions related to domestic league design can be instrumental in enhancing the international competitiveness of local clubs or if applying a certain league design for a different purpose comes at a cost that a league has to bear.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Depending on the country and the legal solutions that apply, national football federations or independent league associations govern domestic football leagues in Europe, including league tournament design (Dietl *et al.*, 2009). To date, some of these decisions have been analysed in the literature in the context of their impact on international competitiveness. These include scheduling, revenue redistribution, and the financial viability of clubs.

In terms of financial viability, the greater financial restrictions applied to the German Bundesliga and French Ligue 1 than to the Spanish La Liga and English Premier League led to weaker results in European competition (Andreff, 2014; Pawlowski *et al.*, 2010). Broadcast revenue distribution may be shared equally among teams or in some form of a performance-based criterion. The more equal the distribution, the higher the competitive balance and intensity within the league (Peeters, 2009, 2012; Wagner *et al.*, 2022). On the one hand, the sporting outcome is more uncertain, which is positive for the attractiveness of the league contest itself; on the other hand, international league representatives

spend less money on wages, which consequently reduces their sporting potential abroad (Caruso *et al.*, 2017; Gasparetto & Barajas, 2018; Hall *et al.*, 2002).

Domestic league scheduling is closely related to league design. Previous studies analysed scheduling from the perspective of interruptions caused by switching tasks and team fatigue due to travel distance and a lack of time to rest between games (Cabras *et al.*, 2022). In the initial research on this issue by Pollard (1986), the length of travel did not affect the results of English football teams in away matches. However, further studies on the German Bundesliga (Oberhofer *et al.*, 2010), National Basketball League (NBA) (Nutting, 2010), National Football League (NFL) (Nichols, 2014), and the National Collegiate Athletics Association (NCAA) (Carter, 2017), showed that, to varying extents (in some cases quite small), increased travel distance decreases the probability of away teams winning.

In an initial study, rest days did not seem to significantly influence the team's performance at the FIFA World Cup and NBA games (Scoppa, 2015). However, a more comprehensive study by Cabras *et al.* (2022), which analysed over 70000 match-level observations spanning 20 years in 11 European football leagues, demonstrated that participating in both past and future Champions League matches has a detrimental impact on team performance in domestic leagues. The decline in performance is more pronounced after a Champions League match, likely due to fatigue. The extent of this effect varies based on factors such as the team's previous performance and whether the team played at home or away. Clubs with poorer recent performance are more susceptible to negative influences, and away teams are more likely to draw or lose when faced with decreased odds of winning due to a Champions League match.

Interestingly, these findings from Scoppa (2015) are consistent with research linking competitiveness in national leagues and UEFA tournaments, which shows that these two areas of club involvement do not influence results in a given season (Kościółek, 2022; Poli *et al.*, 2015). However, inconsistencies arise when looking at domestic results in subsequent seasons after participation in European competitions. Some studies have shown positive effects for clubs outside the top leagues (Moffat, 2020), whereas others have shown no such effects (Kościółek, 2022). Therefore, we can conclude that scheduling which limits rest days could affect the results of individual matches. However, the impact on the overall season is hardly noticeable.

Overall, despite some contradictory findings, following the logic applied in scheduling investigations and the results of Cabras *et al.* (2022), we can assume that different league designs, in terms of the applied contest format, might force clubs to manage their limited resources differently. For example, in split systems, the most important matches come at the end of the season, whereas in a regular two-round system, each game is equally important at any time of the season.

Moreover, we can expect the summer system to be better for international competition than the winter system, as the time between promotion and the start of European competition is shorter. This means that the league is then represented by clubs that were the best a few weeks, not a few months, earlier. Therefore, we hypothesised:

- H1:** The format of domestic league competitions affects football clubs' international competitiveness.
- H2:** The calendar system (winter or summer-based) applied by domestic leagues affects football clubs' international competitiveness.

RESEARCH METHODOLOGY

Measurement

To verify the research hypotheses regarding how the format of league competition affects the international competitiveness of clubs, we designed a research study that applies a series of regression analyses to explain the variance in the sports performance of football clubs in UEFA competitions over the past five seasons (2015/16 to 2021/22, excluding 2017/18 and 2020/21 due to the lack of financial data). We considered the domestic league format and calendar (summer/winter) as independent variables.

In our model, sports performance measured by its contribution to a country's UEFA coefficients (UEFA_POINTS) served as the dependent variable. The explanatory variables were different league designs, coded as dummy variables. Thus, to examine how domestic league design affects international competitiveness as measured by UEFA_POINTS, we estimated the following equation:

$$UEFA_POINTS_{it} = f(LEAGUE_DESIGN_{it}, controls) + \epsilon_{it} \quad (1)$$

The most common solution, *i.e.* the double round-robin system (DOUBLE), was the reference category for competition format, while triple round-robin and quadruple round-robin systems (TRI-QUAD), as well as various forms of split systems (SPLITS), were the other options. Similarly, we included the calendar as a dummy variable, indicating whether the league applied the summer-winter system (SUMMER). We grouped categories that were different from the two-round-based traditional round-robin system, and we applied the same approach to all split systems. This was due to the low number of observations in more fragmented categories. We based this approach on the assumption of the similarity of all split systems in terms of how they can influence clubs' optimisation of managing resources.

The study also incorporated control variables such as league revenues, concentration ratios, and years of observation (SEASON). In line with previous research (*e.g.* Garcia-del-Barrio & Szymanski, 2009; Gasparetto & Barajas, 2018), we applied the logarithm of revenue (LN_REV). Although the most accurate measure of a league's sporting potential involves wages or revenue at the club level, these data were not available for leagues outside the top tier. Instead, we estimated the interaction term between revenue and the concentration ratios of the sporting power held by the best teams in the leagues (those participating in international competitions).

To ensure the robustness of our findings, we employed various measures of concentration following the formulas proposed by Pawlowski *et al.* (2010) for interdivision comparisons among leagues with different numbers of teams. These measures included the concentration ratios for the top two teams (C2ICB – C2-Index for Competitive Balance), the top three teams (C3ICB), and the top five teams (C5ICB) in the league. These ratios indicated the concentration of points achieved by a given number of top teams (two, three, or five) relative to the entire league. The minimum concentration ratio value was 100, with a higher value signifying greater dominance of the specified number of teams within the league.

We calculated the C2ICBs using the following formula:

$$C2ICB = \frac{\sum_{i=1}^2 s_i}{\frac{2}{N}} \times 100 \quad (2)$$

in which s represents the number of points achieved by the top two teams in a particular season of a given league, and N is the number of teams participating in the competition. We applied the same pattern when calculating C3ICB and C5ICB, which we expressed as follows:

$$C3ICB = \frac{\sum_{i=1}^3 s_i}{\frac{3}{N}} \times 100 \quad (3)$$

$$C5ICB = \frac{\sum_{i=1}^5 s_i}{\frac{5}{N}} \times 100 \quad (4)$$

for the best three and five teams, respectively.

In this manner, we could evaluate the degree to which clubs that subsequently represent a country in European competition dominate their domestic leagues. This assessment allowed us to make assumptions regarding the domestic distribution of resources responsible for the international competitiveness of leagues among clubs. To ensure that our calculations were not influenced by the competition system, we calculated C2ICB, C3ICB, and C5ICB based on the league results at the end of the regular season even when the league employed a split-based system. Table 1 presents the list of all variables used in the study and their summary statistics.

Table 1. Overview of variables and summary statistics

Variable	Description	Type	Mean	SD
<i>Dependent variable</i>				
UEFA_POINTS	Points achieved by the teams from the <i>i</i> -th league in the season <i>t</i> of UEFA competitions	Metric	4.883	4.796
<i>Explanatory variables</i>				
DOUBLE	The league applies a two-round system of competition. (Reference)	Dummy	0.315	-
TRI-QUAD	The league applies a three- or four-round-robin system of competition. (1=yes)	Dummy	0.316	-
SPLITS	The league applies one of the split systems of competition. (1=yes)	Dummy	0.369	-
SUMMER	The league applies the summer calendar of competition. (1=yes)	Dummy	0.231	-
<i>Control variables</i>				
REV	Total revenues of the league divided by the number of teams within the league in a given season <i>t</i>	Metric	21.501	48.027
LN_REV	The logarithm of total league revenues divided by the number of teams within the league in a given season <i>t</i>	Metric	1.488	1.770
LN_REV_2	Squared of LN_REV	Metric	0.200	0.400
C2ICB	Consistency ratio for best 2 teams of the <i>i</i> -th league in season <i>t</i>	Dummy	158.724	14.442
C3ICB	Consistency ratio for the best 3 teams of the league in season <i>t</i>	Dummy	150.292	12.300
C5ICB	Consistency ratio for the best 5 teams in the <i>i</i> -th league in season <i>t</i>	Dummy	137.151	12.259
SEASON	Season <i>t</i> when the results given were achieved (2015/16 – Ref; 2016/17, 2018/19, 2019/20, 2021/22; 1 = yes)	Dummy	0.019 ^a	-

Note: ^a relates to shares of each league season in the total sample.

Source: own elaboration.

Data Collection and Analysis

We collected the data in May 2023 from the following sources: UEFA coefficients from the Kassiesa.net online database, league revenues from annual UEFA Club Licensing Benchmarking Reports, and competitive balance measures from our calculations based on league points sourced from Soccerway.com (see the full results for European football league concentration ratios for the seasons 2015/16 – 2021/22 in the supplementary material online – Kościółek and Lubaś, 2023).

In total, we obtained 260 observations from 52 leagues, each of which we observed over five years. Thus, the observations indicated that one national league provided approximately 2% of the total sample. What also noticed the substantial variation between leagues in terms of sporting performance in European competitions ($M_{UEFA_POINTS}=4.883$; $SD_{UEFA_POINTS}=4.796$), revenues per club within the leagues ($M_{REV}=21.501$; $SD_{REV}=48.027$), and, consequently, the logarithm of revenues as well as the revenues' squared logarithm (Table 1). The mean of all consistency ratios ranged from 137.151 (C5ICB) to 158.724 (C2CB), and the standard deviations ranged from 12.259 (C5ICB) to 14.442 (C2CB).

Unsurprisingly, the TOP5 leagues observed the highest revenues per club and UEFA points, with Spain achieving the best results in the 2015/16 season (23.928) and England performing well in both the 2018/19 (22.642) and 2021/22 (21.000) seasons. England also generated the highest revenues per club, ranging from 293.2 million euros in 2019/20 to 220.3 million euros in 2015/16. Regarding concentration ratios, Armenia in 2019/20 showed the most balanced league according to C2ICB and C3ICB, whereas Kazakhstan in 2021/22 showed the most balanced league according to C5ICB. At the other end of the spectrum, the least balanced leagues were Ireland in 2019/20 (C2ICB=200.618; C3IB=185.555) and England in 2016/17 (C5ICB=212.067).

The double round-robin system, the most traditional tournament design in European football, was the most popular, accounting for 31.5% of the leagues over the past five years. The second most popular format is the four-round robin system (20.8%), followed by split systems such as two-plus-two (18.5%), three-round robin (10.8%), two-plus-one (6.9%), and three-plus-one (4.6%). There were also various other split formats (6.9%), including four-plus-one, three-plus-two, and one-plus-two. Moreover, the winter-summer system of competition system has consistently been dominant across Europe, with the summer-winter option being adopted in only 23.1% of cases, including Belarus, Estonia, Faroe Islands, Finland, Georgia, Iceland, Kazakhstan, Latvia, Lithuania, Norway, Ireland, and Sweden.

RESULTS AND DISCUSSION

The initial inspection of the functional shape revealed a polynomial relationship between league revenue per club and the number of UEFA points. Therefore, we included the square of LN_REV in the seven estimated models. In Model (1), we examined the impact of SUMMER on UEFA_POINTS was examined and in Model (2), we conducted the same analysis for all league design formats. In subsequent models (3-7), we included the SUMMER and league design formats together. Furthermore, we alternatively added consistency ratios to certain models, and in Models (6-7), we included them as an interaction with LN_REV and LN_REV_2. As shown in Table 2, the results demonstrate statistically significant models ($p < 0.001$ for each) that fit the empirical data well (adj. R-squared > 0.80). These models consistently identified variables that significantly influence UEFA_POINTS, which represent sports outcomes at the international level.

The application of the summer calendar to the national league did not impact clubs' international competitiveness. This finding remains consistent across different model specifications. Whether tested independently without other league design elements (Model 1) or in conjunction with them, both with and without the inclusion of concentration ratios (Models 3-7), the variable representing the summer calendar (SUMMER) was not statistically significant. Furthermore, when considering various league format variables (Models 2-7), they did not show an effect on the number of points achieved in UEFA competitions. Consequently, we can conclude that formats such as DOUBLE, TRI-QUAD (triple and quadruple), SPLITS (split two-plus-one, two-plus-two, three-plus-one, and others) do not significantly affect European football clubs' international competitiveness. Therefore, we rejected both Hypothesis 1, which concerns the role of the domestic league format in explaining the international competitiveness of football clubs, and Hypothesis 2, which assumes a relationship between the calendar and international competitiveness.

On the one hand, these results contradict the logic of the institutional-based view, which suggests that adopting a different league system can benefit clubs by enabling them to earn more points in UEFA competitions each year. However, it strengthens the findings of previous research, indicating that engagement in international competitions can affect a club's performance in the short run, particularly in terms of unfavourable scheduling for specific games (Cabras *et al.*, 2022), but does not significantly impact results in the medium term, when considering the outcome over the entire season (Kościółek, 2022; Poli *et al.*, 2015).

As expected, league revenues, represented by LN_REV and LN_REV_2, were the main factors explaining clubs' sports performances in a given league. This is consistent with the literature on sports clubs' competitiveness, which emphasizes the importance of financial resources in the form of revenue and wages in explaining sporting performance (Caruso *et al.*, 2017; Gasparetto & Barajas, 2018; Rohde & Breuer, 2016). However, the concentration ratio of these revenues within the leagues significantly influenced international sporting performance ($p < 0.01$), although the magnitude of this impact was relatively small. We may attribute this to the divergence in the global football market over the past three decades (Bullough, 2018), which resulted in significant differences in the leagues' financial potential. Consequently, the redistribution of revenue between teams at the domestic scale does not have as much of an international impact as might have been assumed.

In practice, these discoveries provide significant insights for league management. The prevailing perspective in discussions on league design in the mass media has primarily focused on evaluating its

influence on the overall competitiveness within a league (Bugaj, 2020). However, based on our findings, it appears that when considering the choice of competition format, one can focus on internal effects. These include maximising revenues from television rights, enhancing the competition's attractiveness by balancing competitive balance or restricting the influx of teams into the league that do not meet the required sporting standards. However, the aspect of international competitiveness should not be the central focus in the context of league design discussions.

Table 2. Results of regression analyses

Statistics	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Explanatory variables</i>							
DOUBLE	-	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
TRI-QUAD	-	-0.318	-0.339	-0.234	-0.027	-0.089	-0.193
SPLITS	-	0.423	0.295	0.208	0.296	0.371	0.369
SUMMER	-0.572	-	-0.391	-0.339	-0.413	-0.423	-0.329
<i>Control variables</i>							
LN_REV	0.697***	0.632**	0.638***	0.631**	0.661***	0.671**	-
LN_REV_2	0.425***	0.448***	0.438***	0.429***	0.424***	0.417***	-
C2ICB	-	-	-	0.039***	-	-	-
C3ICB	-	-	-	-	0.049***	-	-
C5ICB	-	-	-	-	-	0.032**	-
LN_REV x C2ICB	-	-	-	-	-	-	0.005***
LN_REV_2 x C2ICB	-	-	-	-	-	-	0.003***
SEASON	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.
CONSTANT	1.646***	1.459***	1.639***	-4.531***	-5.833***	-2.826	1.516***
<i>Models assessment</i>							
F	173.62 ***	153.09 ***	136.47 ***	134.87 ***	136.38 ***	127.25 ***	157.04 ***
adj.-R ²	0.823	0.824	0.825	0.838	0.839	0.830	0.844
St. error	2.019	2.013	2.011	1.935	1.926	1.983	1.896
N	260	260	260	260	260	260	260

Note: *p<0.05; **p<0.01; ***p<0.001.

Source: own elaboration.

Terrien and Andreff (2020) indicate that while aiming to maximise its objectives, including ensuring relative competitive balance on one hand and striving to have the best clubs at the international level on the other, a league faces a trade-off challenge between these goals. Considering that league design is inherently a tool aimed at maximising one of these objectives, *i.e.* actions to increase competitive balance, it remains without adverse effects on the others, particularly on the sporting performance of clubs abroad.

CONCLUSIONS

Based on the results, we can conclude that neither the domestic league format nor calendar systems affected sports performance at the international level. We might have expected that the adoption of a split system would allow clubs to strategically allocate their resources, especially key players, to international contests during the initial phase of the season. We based this assumption on the idea that crucial domestic league games would take place in the later stages of the national contest, by which time many of them had already been eliminated from UEFA competitions. However, our results show that this is not the case.

Therefore, although we did not find the league design to influence external sports performance, our findings significantly contribute to the institutional-based view of building international competitive advantage for firms (Martin, 2014; Peng *et al.*, 2009; Polowczyk, 2011). Landau *et al.* (2016) contended that 'favourable conditions' are advantageous only for firms capable of generating

unique resources through engagement with their home country's institutional environment. Our empirical findings demonstrate that institutions in the sports industry, indeed, need to stimulate the creation of additional resources, as the change in the allocation of actors' existing resources resulting from competition design does not enhance their competitiveness abroad.

It remains equally important that sports league governing bodies can influence the uncertainty of outcomes within the league through tournament design without compromising their other objectives (Terrien & Andreff, 2020). Based on this study, we can recommend using league design as a tool to stimulate competitive balance in the league. In contrast to different methods, such as a more equal sharing of broadcasting revenues among teams (Peeters, 2009, 2012; Wagner *et al.*, 2022), league design inherently impacts competition intensity without affecting clubs' international competitiveness.

However, both academics and practitioners should also be mindful of the methodological limitations of this study. Firstly, to facilitate quantitative investigation, we grouped various forms of split systems, resulting in larger categories. Secondly, this research relied on concentration ratios to approximate the distribution of forces within the league for estimation purposes. In future research, it would be beneficial to delve deeper and include data on player wages or, at the very least, the values of team squads representing the given leagues in UEFA competitions, rather than solely relying on league-level data. Using match-level data would also allow for the testing of different split formats of competition separately, potentially providing a more robust verification of the preliminary research presented in this article.

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