Is the UEFA Champions League Fair?

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Abstract. Is access to the UEFA Champions League based on sporting merit? We test whether a marginally excluded team from domestic league i is expected to perform better than a marginally included team from domestic league j. Using past performance as a predictor of future performance, our answer is a resounding yes. We compute the counterfactual of an access rule based on sporting merit and show that the vast majority of slots would be allocated to top European leagues. Finally, we propose a simple adjustment rule that mimics the promotion-relegation system common in national league structures.

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1. Introduction

In April 2021, twelve top European football (soccer) clubs, including six English clubs, discussed and negotiated the possibility of a breakaway European Superleague.[1] The reaction by English fans was as firm as it was unexpected, including protests before and during various games. Their voice was heard loud and clear: the Superleague plans "went against the ethos of meritocracy that remains the bedrock belief of the vast majority of soccer fans" (Herman, 2023). The sentiment is shared by UEFA leadership (UEFA is the European football's organization). In October 2023, UEFA president Aleksander Čeferin remarked that

> We are fully committed to respecting the fundamental values of sport and to defending the key principle of open competitions, with qualification based on sporting merit (UEFA, 2024).

One natural interpretation of "sporting merit" is that the qualification system has the goal of selecting the best clubs, that is, the set of clubs expected to perform best. Considering specifically the case of UEFA's Champions League (UCL) — the present paper's focus — one expects the principle of "qualification based on sporting merit" to imply that, at the margin and on ex-ante expected terms, one would *not* be able to replace one of the selected clubs with a better one.

In this paper, we analyze club performance from 2003–2023 so as to test whether the qualification system is consistent with sporting merit. The test is based on the following conceptual experiment: would a marginally excluded club from domestic league i perform better (in expected terms) than a marginally included club from domestic league j? If this is so, and if it happens in a systematic manner, then one can argue that the qualification system is not based on merit — or, to be precise, is not solely based on merit.

We present a simple model that formalizes our statistical approach. When we apply it to the data, we clearly reject the null hypothesis of qualification on merit. As a preliminary step to estimate the "merit gap" in UCL access, we divide domestic leagues into three tiers according to 2023 access rules: Tier 1 (England, Spain, Germany, Italy, France); Tier 2 (other domestic leagues with guaranteed UCL spots); and Tier 3 (all other leagues). Average UCL performance across tiers is staggering: the differences are large and identified with statistical precision.

However, differences in averages are not the most relevant for sporting merit: the relevant comparison is across "marginal" teams from each league, that is, the last club to qualify from each domestic league (a difference that matters for leagues with multiple qualifying slots). We consider two alternative methods to estimate, out of sample, the performance of clubs that did not actually play the UCL. Applying these methods to the English Premier League (EPL), we predict that several English clubs not playing the UCL would perform considerably better than several teams actually playing the UCL. Specifically, on average the top seven EPL clubs would perform better than the average Tier 2 club; and just about all EPL clubs would perform better than the average Tier 3 club.

1. This was not the first proposal of a breakaway superleague (and the argument may be made that it will not be the last). Unlike previous proposals, the 2021 format included the possibility of promotion and relegation from the superleague. In Section 6, we put forward a UCL proposal that also features elements of promotion and relegation.

The fact that UCL access is not based on merit alone may not come as a surprise. Other considerations, such as "solidarity" among countries and national leagues, also plays a role. That said, we believe it is important to acknowledge the merit-solidarity trade-off explicitly. Our paper provides a step in that direction by directly estimating the size of the merit "gap."

We also propose a revised process of UCL access, one that is based on the Economics-cherished marginal-analysis principle as well as on the football-cherished promotion-relegation principle. Under this system, domestic leagues would see their number of guaranteed slots change as a function of their "marginal" club performance. A simple simulation of the system predicts that, in equilibrium, the number of guaranteed slots would be highly concentrated among the top leagues.

There is an extensive literature on the design of sports competitions (Szymanski, 2003).[2] More specifically related to our paper, recent research examines the structure of the UCL. For example, Dagaev and Rudyak (2019) and Engist, Merkus, and Schafmeister (2021) evaluate the effects of the seeding system, whereas Csató (2022) discusses the entry path for clubs from lower leagues. Our paper differs in that it addresses the issue of fairness across leagues in a formal manner, both theoretically and empirically.

Recent work directly consideres the issue of access fairness, though not in the context of the UCL but rather the FIFA World Cup: Stone and Rod (2016), Krumer and Moreno-Ternero (2023). These papers are based on average performance by each feeding group of federations (e.g., UEFA or COMCAF). However, as we argue below, we believe the correct approach is to consider *marginal* performance, rather than average performance.

The remainder of the paper is organized as follows. In the next section, we develop a simple model that allows us to formally define the concept of sporting merit. Sections 3 and 4 include the core of our empirical analysis. In Section 5, we propose a specific access rule and simulate the effect of its implementation. Section 7 concludes the paper.

2. Defining and testing sporting merit

Suppose the performance of club x in a given competition is given by

$$\pi = x + \epsilon \tag{1}$$

where ϵ has zero mean and is independently and identically distributed across all clubs. Suppose there are two sets of clubs, A and B. For simplicity, we treat each set as a continuum, with the values of x distributed in the interval $[\underline{x}_i, \overline{x}_i]$, with $i = A, B$. Let $F_i(x)$ be the measure of clubs with expected performance greater than x. Note this is related to, but different from, a cumulative distribution function.

Throughout the paper, we take fairness to imply selection based on merit, that is, selecting the set of clubs with highest x. Suppose that the tournament comprises a measure m on clubs. The following result holds:

Proposition 1. *The optimal selection consists of a threshold x' such that clubs with $x > x'$ are selected and $F_a(x') + F_b(x') = m$.*

2. The reader interested in a more general introduction to sports economics, and in particular football (soccer), is directed to Palacios-Huerta (2014) and Palacios-Huerta (2023).

The proof is straightforward: Suppose, without loss of generality, that $x'_A > x'_B$. Then we could substitute a measure of clubs from A in the left neighborhood of x'_A for an equal measure of clubs from B in the right neighborhood of x'_B, noting that all replacements have higher values of x.

As an example, suppose that the threshold for access to the UCL in league A corresponds to the fourth place (or better), whereas the threshold in league B corresponds to second place (or better). If the UCL performance of a 4th place in league A is significantly better than the UCL performance of a 2nd place in league B, then the case can be made that a 5th place from league A should replace the 2nd place from league B in access to the UCL.

Let us consider again the case of a continuum of clubs in each league. If the thresholds x'_A and x'_B are equal, then the expected performance of the "marginal" clubs in leagues A and B should should be the same. By "marginal" we mean the least placed club in the national league that makes it to the UCL. Formally, we have the following result:

Proposition 2. *Let x'_i be the "marginal" club in group i, that is, the club with $x = x'$. Then $\mathbb{E}(\pi_{x'_a}) = \mathbb{E}(\pi_{x'_b})$, that is, the expected performance levels of the marginal clubs are equal.*

The proof is relatively straightforward: By Proposition 1, $x'_A = x'_B$. Since expected performance is given by (1) and ϵ is identically distributed, it follows that $\mathbb{E}(\pi \mid x = x'_A) = \mathbb{E}(\pi \mid x = x'_B)$.

Proposition 2 provides a natural way to test whether the selection system is fair. At the margin — that is, for two marginal clubs — expected performance should be the same; and actual performance is a good signal of expected performance.

One important difference between the above theoretical model and the real world is that we assumed a continuum of clubs, whereas, in reality, the total number n of clubs is a finite number. We thus conclude this section with a convergence result. Suppose that the fraction of the total number of clubs belonging to group i is bounded away from zero. Then

Proposition 3. *Let x'_i be the "marginal" club in group i, that is, the qualifier with lowest x. As n tends to infinity, $\mathbb{E}(\pi_{x'_a}) - \mathbb{E}(\pi_{x'_b})$ converges to zero almost surely.*

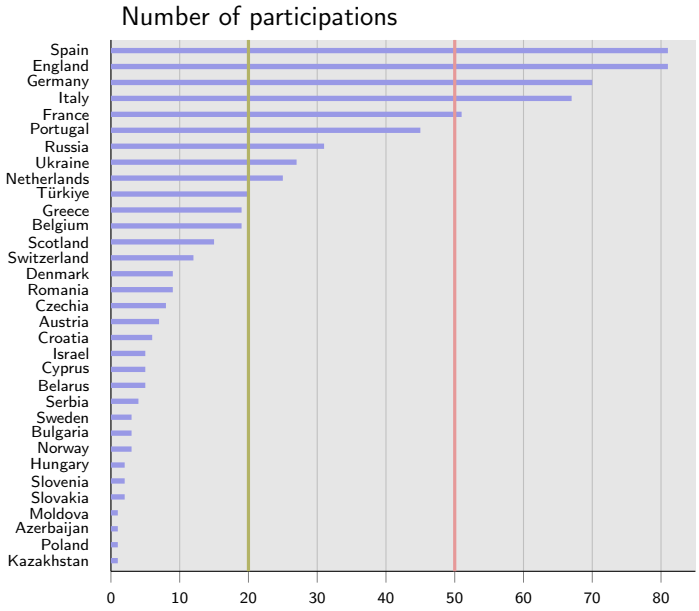
In what follows, we apply these results to test the null hypothesis of fair selection into the UCL. In addition to taking into account the difference between theoretical results on a continuum and discrete empirical data, the test also requires estimating UCL performance by clubs that did not actually compete in the UCL.

3. A first look at the data

The site uefa.org publishes club performance measures at the club-year level. We downloaded the data corresponding to all clubs participating in the UCL in any season from 2004-2005 to 2023-2024.[3] Each year's coefficient is calculated as the sum of the club's previous five seasons' performance points, both during the group stage and during the knock-out phase of UEFA-sponsored European competitions. From these five-year sums, we backed out each club's season-specific performance coefficient. UEFA also publishes country-level performance coefficients, basically by adding the performance coefficients of all clubs in the

3. The specific URL is https://www.uefa.com/nationalassociations/uefarankings/club/#/yr/2024. The data was downloaded manually.

Figure 1
Country participants in UCL (at club-year level) in twenty seasons, from 2003–2024. We define a Tier 1 country as having 50 or more entries, Tier 2 from 20 to 49 and Tier 3 less than 20.



country. Similar to club-level coefficients, we backed out the season-specific performance coefficient at the country level.

Next, we created a dataset with the UCL group stage distribution for all seasons. This was initially compiled by ChatGPT and then double-checked by hand. Club names were then matched with those in the UEFA coefficient data.

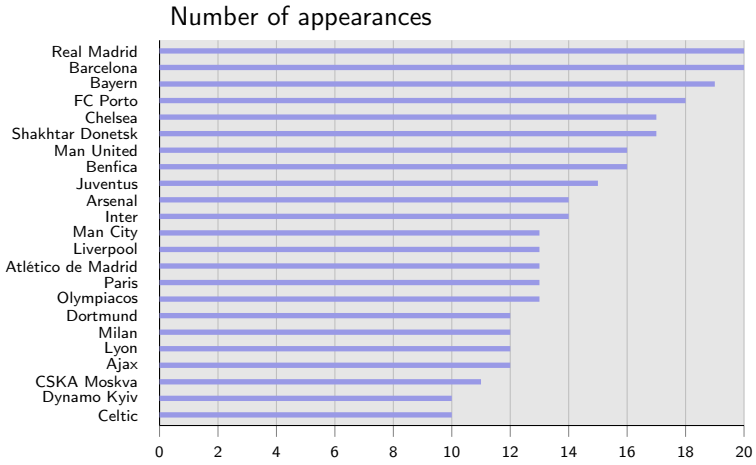
Selection into the UCL varies by country. Figure 1 shows the number of participants by country over a twenty-season period. Spain and England come out on top with 81 participants each.[4] Based on this data, we define three tiers of country participation in the UCL as follows:

- Tier 1. Countries with 50 or more participants in two decades: Spain, England, Germany, Italy, and France.
- Tier 2. Countries with 20 to 49 participants: Portugal, Russia, Ukraine, The Netherlands, Turkey.
- Tier 3. All other countries.

It should be noted that the ranking of countries with most participation is not perfectly correlated with the nationality of the ranking of clubs with most entries into the UCL. Figure 2 presents a ranking similar to Figure 1, with the difference that it lists clubs rather than countries. In the two decades we consider, there are a total of 126 clubs who entered the UCL. Approximately one half of these only entered once or twice. The listing in Figure 2 is limited to clubs with ten or more entries.

4. This corresponds to slightly more than four participants per season, which is the assigned number of clubs for these leagues. The difference results from cases when the winner of the Europa league, which automatically qualifies for the UCL, did not place among the top four in the domestic league.

Figure 2
Club participation in UCL (number of years) in twenty seasons, from 2003–2023. Only clubs with 10 or more entries are shown.



The contrast of Figures 1 and 2 illustrates the differences between country rankings and club rankings. For example, Benfica and FC Porto, both Tier 2 clubs, are among the top 10 clubs in terms of UCL participation. The reason is that some leagues have less turnover of clubs at the top. Specifically, there is very little turnover in the Portuguese league: the top two places are typically taken by Benfica or Porto or both. Portugal places, on average, about two clubs in the UCL, whereas England, Spain, Germany, and Italy together place sixteen clubs in the UCL. Notwithstanding this contrast in ease of access, and as the result of low turnover in the Portuguese league, we find that the Portuguese league is represented in the top 10 of Figure 2 by as many clubs as Italy or Spain or England — and more than Germany!

Our main goal in this paper is to test whether access to the UCL is fair, in the sense that it is solely based on sporting merit. A natural way of measuring sporting merit is the expected performance in the competition. Specifically, one might say that two clubs have identical sporting merit if their expected performance in the UCL, based on past performance, is identical. In other words, selection by sporting merit is the selection that maximizes the performance of the selected clubs. As mentioned in the introduction (and in the proof of Proposition 1), if different leagues have different thresholds in terms of sporting merit, then a re-assignment of slots across leagues would increase the overall expected average performance of the clubs selected into the UCL.

A very first pass at the data consists in comparing club performance across tiers. Figure 3 depicts the kernel density of club performance by tier. While there is considerable variance in performance, it seems clear that average performance in Tier 1 is greater than average performance in Tier 2, which in turn is greater than average performance in Tier 3.

A second pass at the data consists in comparing club performance across tiers. If, broadly speaking, the UCL performance of clubs is relatively uniform across clubs, then one would be inclined to agree that access to the UCL takes place in a fair manner.

Figure 4 plots two dimensions of a club's performance: number of appearances in the UCL (during a twenty-season period) and average club coefficient across the seasons when

Figure 3
Kernel density of club performance by tier

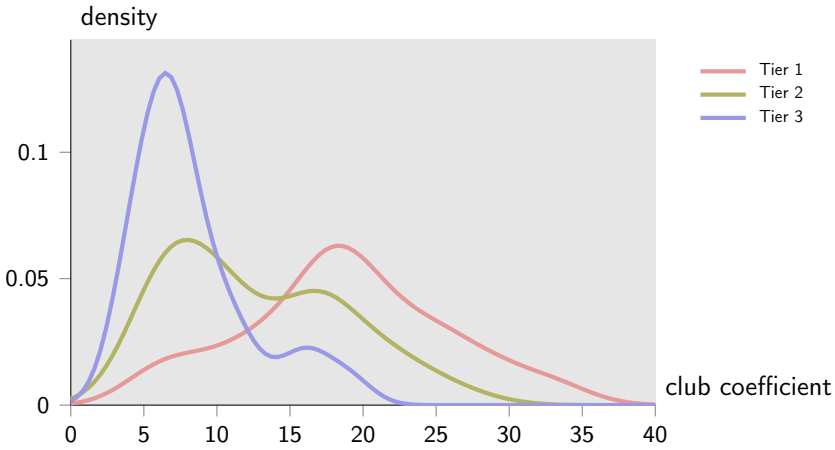
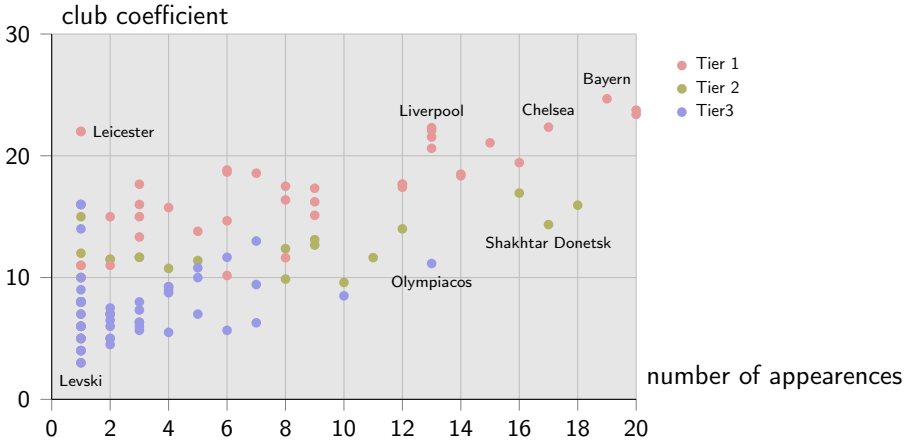


Figure 4
Club performance and number of appearances in UCL, color-coded by tier.



the club played the UCL. The scatter is color-coded according to tier. Generally speaking, we observe a positive correlation between number of appearances and average coefficient per season. This is not surprising: very strong clubs tend to place high in their domestic leagues, thus being selected into the UCL; and then perform well in the UCL. This is the case, for example, with Real Madrid and Barcelona, the only two clubs with twenty appearances out of twenty. These clubs have the second and third highest club coefficient, behind Bayern Munich, which has the highest average coefficient and nineteen appearances.

However, the most noticeable feature of Figure 4 is that, conditional on the number of appearances, the clubs with the higher coefficient are typically Tier 1 clubs, whereas the clubs with lower coefficient are typically Tier 3 clubs. Consider, for example, clubs that only played the UCL once during our twenty-season period. Leicester, a Tier 1 club, has by far the highest coefficient of all clubs in this set. Or consider the clubs that appeared exactly thirteen out of twenty times: Liverpool, Paris SG, Atletico Madrid, and Olympiacos.

The difference in performance is considerable, with Liverpool, a Tier 1 club, performing at about twice the level of Olympiacos, a Tier 3 club. Or consider the clubs that appeared exactly seventeen times, Chelsea, a Tier 1 club, and Shakhtar Donetsk, a Tier 2 club. The difference is not as significant as the Liverpool-Olympiacos game, but it is still significant.

This suggests that the system is not quite based on pure sporting merit: were that the case, one would expect that, on average and across tiers, higher-performance clubs would enter the competition more frequently. However, one must take Figure 4 and the above comparison across leagues with a grain of salt: Comparing average performance across leagues is not the right way to test meritocracy. The fact that Bayern Munich systematically performs above other clubs does not imply that we should select more German clubs to play in the UCL. Bayern Munich and Real Madrid are largely "infra-marginal" clubs: they most likely qualify for the UCL ahead of other clubs in the same domestic league. What really matters in terms of comparison across leagues is the relative performance of "marginal" entries into the UCL. This we deal with in the next section.

4. Testing pure sporting merit

Since our theory has predictions at the margin, for each country we define the marginal club as the lowest-placed club in the respective national league that gained access to the UCL group stage. This corresponds to the 4th place in Tier 1 leagues, though there are a few exceptions, which we consider explicitly.[5] In Tier 2, there is a lot of variation regarding the number of automatic slots, which forced us to determine them manually.[6] Finally, all clubs in Tier 3 are marginal clubs, since only one club per country has access to the UCL.

Based on this method, for each season t we classify a club as marginal if it qualified marginally, that is, if in season $t-1$ it was marginal according to the above criterion. Having defined marginal clubs, we are ready to test the null hypothesis that access to the UCL is based on sporting merit. Essentially, this corresponds to a test of Proposition 3, namely that, as n tends to infinity, $\mathbb{E}(\pi_{w_a}) - \mathbb{E}(\pi_{w_b})$ converges to zero almost surely, where π_{w_a} and π_{w_b} is the performance of the marginal clubs in leagues a and b. Our estimate of the expected value is obtained by taking the average of all instances within a given tier. In other words, we compare the average performance of all Tier i clubs who qualified as a marginal entrant.

The results from testing our null hypothesis of selection on merit only, shown in Table 1, are unambiguous: Marginal clubs from Tier 1 perform 21% better than marginal clubs from Tier 2 and a whopping 79% better than marginal clubs from Tier 3. Moreover, all cross-tier differences are statistically significant. In fact, expected performance levels are estimated with a fairly high degree of statistical precision.

These results are not proof, but strongly suggest, that access to the UCL is not based solely on sporting merit. In particular, the results suggest that there exist clubs from Tier 1 leagues that are not included in the UCL but would perform better — possibly substantially

5. For the 17/18 season, Germany and Italy's marginal clubs were the 3rd places in the national league. For Italy and for the 14/15 and 15/16 seasons, the marginal club was the 2nd place. For Spain in the 15/16 season, the marginal club, Sevilla, placed 7th in the national league. In France, the marginal club varies between the 2nd place or the 3rd place

6. For example, in Portugal the marginal club varies between first and second place in the domestic league.

Table 1
Test of null hypothesis of selection by sporting merit

Index	Average	St Dev	
Tier 1 coefficient	15.880000	6.273690	
Tier 2 coefficient	12.810526	6.282862	
Tier 3 coefficient	8.343284	4.063601	*p* Value
Tier 1 - Tier 2	3.069474	0.899506	7.85E-04
Tier 1 - Tier 3	7.536716	0.718903	7.02E-20
Tier 2 - Tier 3	4.467242	0.733996	9.37E-09

better — than clubs that are included in the UCL. We stress the word *suggest* because it is possible, in theory, that the expected performance of Tier 1 clubs excluded from the UCL is lower than the expected performance of marginal clubs from other tiers. In other words, Proposition 3, the theoretical basis for the tests reported in Table 1, is based on a model with a continuum of clubs per league. The real world is discrete and, in principle, there may exist discontinuities that break the link between our theoretical model and reality.

In the next section, we propose a counterfactual exercise to push the analysis farther, in particular by making a stronger case that the current selection system is indeed very far from pure sporting merit.

5. Counterfactual analysis

The evidence presented in the previous section makes a strong case that entry into the UEFA Champions League is not solely based on sporting merit. The differences in marginal club performance across tiers are large and statistically significant. In this section, we take the analysis one step farther by asking the following question: if access to the UCL were *solely* based on expected sporting performance, how would the number of clubs per domestic league change? Specifically, we focus on the English Premier League and use the estimates from the previous section to estimate the counterfactual whereby selection into the UCL is based on sporting merit only.

One challenge with performing this counterfactual is to predict the performance of English clubs that do not participate in the UCL but would participate if the rules were more meritocratic than the current rules. We consider two alternative strategies to deal with this challenge, both of which are based on the assumption that domestic performance is a good predictor of UCL performance.

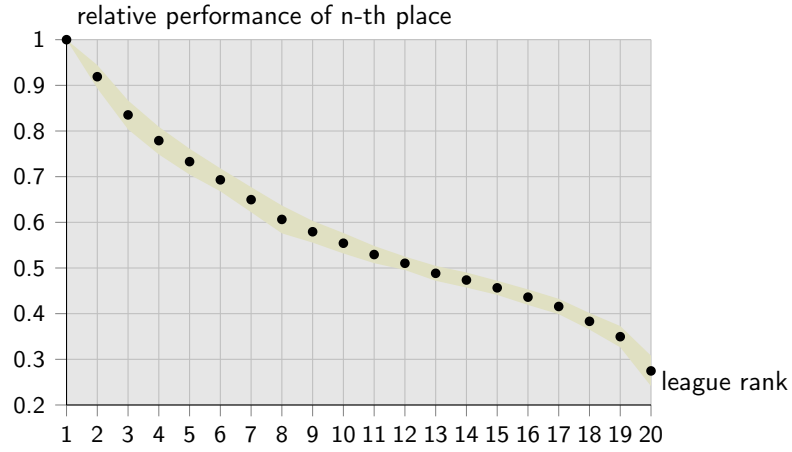
Our first approach is based on regression analysis. Specifically, we consider the domestic and European performance of the clubs located in countries with four guaranteed entries: England, Spain, Germany, and Italy. We measure domestic performance by the number of points attained in the domestic league, normalized as a ratio with respect to the league winner. In other words, domestic league performance is a value $x \in [0, 1]$, with $x = 1$ corresponding to the winner. Regarding European performance, we continue to use the UEFA-generated coefficient.

Table 2 shows the results of two regressions where the dependent variable is European

Table 2
Domestic performance and European performance without and with country fixed effects (England dummy omitted)

Dependent variable:	UCL performance	
Domestic league performance	15.904*** (3.572)	16.375*** (3.537)
Germany		-2.305* (1.100)
Italy		-3.055*** (1.130)
Spain		-0.118 (1.071)
(Intercept)	5.786 (3.166)	6.633 (3.193)
Adjusted R-squared	0.065	0.093
N	273	273

Figure 5
English Premier League. Relative performance (number of points) of n-th place relative to winner. Based on 2003-2023 seasons. Shaded 95% confidence interval.



performance in season $t+1$. The critical dependent variable is domestic league performance in season t. The two regressions differ in that the second one allows for country fixed effects. The coefficient of domestic lead performance is estimated with precision and is relatively robust to the inclusion of country fixed effects. Although club performance by country is not the focus of our analysis, we note that English and Spanish clubs have the same fixed effect, whereas Germany (and especially Italy) show lower performance than Spain and England (England being the omitted dummy).

Next, we compute the relative domestic performance of all clubs of the English Permier

League (during a 20-season period). The results are shown in Figure 5, both the point estimate and the 95% confidence interval of each EPL place. While we are working in a world of discrete values (there are only twenty teams in the EPL), it is reassuring that the sequence of performance values seems sufficiently "continuous" to justify the assumption implicit in the theoretical analysis of Section 2. Also, while there is some variation from season to season, we note that the average relative number of points of each rank is estimated with reasonable precision. That said, one must admit that, for many of the ranks, there is an overlap in the confidence intervals. For example, the confidence interval of the 5th rank's relative performance is [0.75,0.81], whereas the confidence interval of the 4th rank's relative performance is [0.71,0.76], i.e., there is a slight overlap between the two confidence intervals.

Finally, using (a) the regression results in Table 2, (b) the relative performance coefficients in Figure 5, and (c) the average UCL performance of the marginal club (that is, the EPL club that qualified as 4th place in the domestic league), we predict the performance of the EPL clubs placed in 5th, 6th, etc, place, that is, clubs that were not allowed in the UCL. Formally, let $f(d)$ be the function estimated in the fixed-effects regression in Table 2, that is,

$$f(d) = 6.633 + 16.375\, d$$

Then, the predicted European performance of a team ranked n in the EPL is given by

$$e(n) = e(4)\,\frac{f(n)}{f(4)} \tag{2}$$

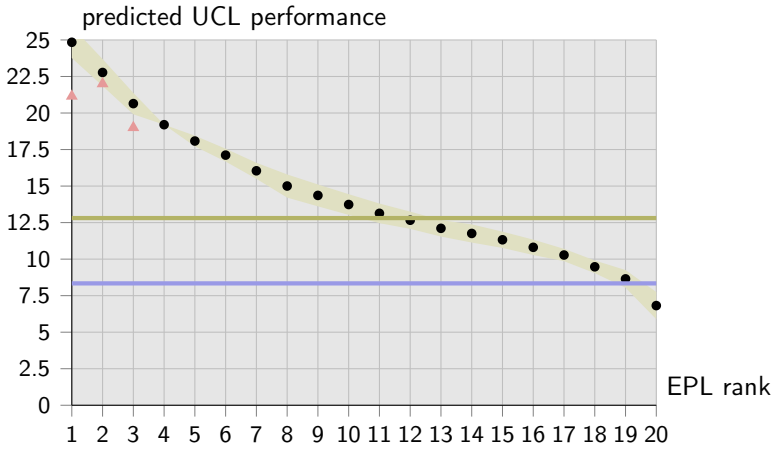
where the value of $e(4)$ is estimated from historical data. For the EPL and over a 20-season period, we estimate $e(4) = 19.2$. This leads to Figure 6, which shows predicted performance by EPL teams in season $t+1$ as a function of their EPL rank in season t. The results are shown in Figure 6. As expected, the shape is very similar to that of Figure 5. This is because we estimate a linear relation between EPL performance in season t and UCL performance in season $t+1$. The figure also shows that *actual* performance of the club that qualified as 1st, 2nd and 3rd. This allows us to get a feel for our model's goodness of fit.

Specifically, Figure 6 shows that the actual UCL performance of the previous year's EPL champion is lower than predicted by our model. In other words, we observe a reversion-to-the-mean effect that is not accounted for by a model that assumes UCL performance in year $t+1$ is linearly determined by EPL performance in year t.

The two horizontal lines in Figure 6 represent the average performance of a Tier 2 or Tier 3 team. By comparing EFL club performance to these lines, we predict that a club placed 11th in the EFL would outperform an average UCL Tier 2 club, whereas all clubs except the very bottom EFL club would outperform an average UCL Tier 3 club! In other words, if the UCL bar were established at the level of a Tier 3 club performance level, then *sporting merit dictates that essentially all EFL clubs would perform better than the least performing clubs in the UCL.*

One limitation of this prediction strategy is that we are using season t performance to forecast season $t+1$ performance. The adjusted R^2 from the regressions in Table 2 are very small, reflecting that there is a lot of noise. A lot happens between seasons: squads change, managers change, and so on. For example, Figure 5 suggests that even an EPL club ranked 19th would outperform the average Tier 3 UCL club. However, an EPL club ranked 19th would be relegated and, very likely, divest many of its key players, thus lowering its expected performance.

Figure 6
Predicted European performance as a function of EPL performance. Green and blue lines measure average UCL performance of Tier 2 and Tier 3 teams.



This limitation suggests an alternative prediction method, one where season t UCL performance is predicted based on season t EPL performance. Suppose that, given two clubs in the EPL, *relative performance in the EPL during season t is a good proxy of relative performance in the UCL during the same season.* Since we are interested in determining access rules based on past performance, we begin by predicting domestic league performance in season $t+1$ based on performance in season t. Specifically, based on 20 seasons of EPL data, we estimate the Markov transition matrix of EPL ranking, $M = [m(i,j)]$, where $m(i,j)$ is the probability that the ith ranked club in season t is ranked j in season $t+1$. Let $d(n)$ be expected domestic league performance as a function of rank. This is the function we estimate and plot in Figure 5. Then, the expected performance in season $t+1$ of a cub ranked i in season t is given by

$$\sum_{j=1}^{20} m(i,j)\, d(j)$$

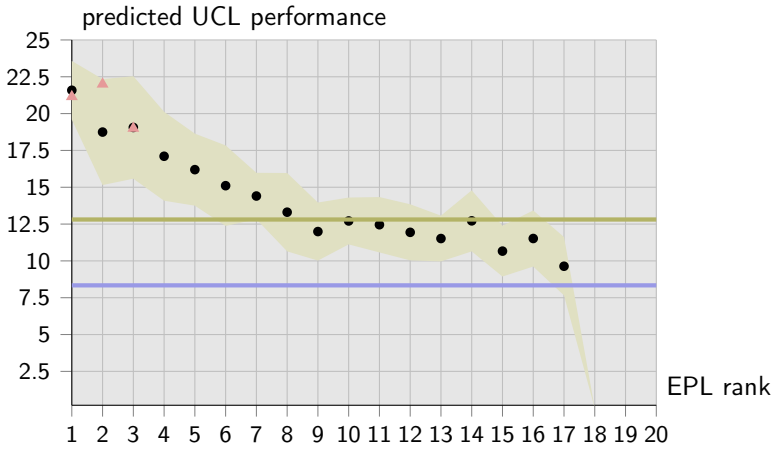
Finally, the expected UCL performance in season $t+1$ of a team ranked i in season t is estimated to be

$$e(i) = e(4)\, \frac{\sum_{j=1}^{20}\ m(i,j)\, d(j)}{\sum_{j=1}^{20}\ m(4,j)\, d(j)} \tag{3}$$

where $e(4)$, expected UCL performance by the marginal EPL club entering the UCL, is directly estimated from the data. As mentioned earlier, we obtain a value $e(4) = 19.2$.

The results from this second method are displayed in Figure 7. Qualitatively, the results are similar to those obtained for the first predictionmetho. We predict that a club placed 8th in the EFL would outperform an average UCL Tier 2 club, whereas any EFL club that is not relegated would outperform an average UCL Tier 3 club!

Figure 7
Predicted European performance as a function of EPL performance. Green and blue lines measure average UCL performance of Tier 2 and Tier 3 teams.



6. Proposal

Lest the reader think that our contribution is merely to make the negative point that the current UCL format is not fair (in a sporting merit sense), we now offer a specific proposal that would bring us closer, we argue, to selection based on sporting merit. Our proposal is based on the principle — so dear to the European sports leagues tradition — of promotion and relegation.

Each UEFA domestic league has a guaranteed number of slots — possibly zero — for direct UCL access, as well as one slot in the UCL play-in qualification stage. Each season, UEFA computes each country's (that is, each domestic league's) performance coefficient based on the previous five seasons' UCL performance of the club that qualified through the play-in process. For example, assuming that the EPL has four guaranteed slots, the EPL coefficient would be based on the past UCL performance of the club that qualified as 5th place (and thus played the play-in), noting that, from season to season, this may be — and likely will be — a different club.

The promotion/relegation process then works as follows: Each season, the country with highest coefficient is given an additional guaranteed slot, whereas the country with the lowest coefficient *among the countries with a currently positive number of slots* is taken a guaranteed slot away.

Since the current system does not allow EPL clubs to qualify through the play-in, it is difficult to simulate the effect of the proposed rule. As an approximation, we may estimate the performance of an EPL play-in qualifier by the performance of the marginal qualifier (currently the club placed 4th in the EPL).

The values in Table 3 suggest that the league with highest "marginal" coefficient is the EPL, whereas the domestic league with the lowest "marginal" coefficient is Sweden. However, Sweden has zero guaranteed slots and is thus not eligible for "relegation." Among the domestic leagues with a strictly positive number of guaranteed slots, two are tied for the lowest performance: Scotland and Serbia. In this case, we would need to find a tie-breaking

Table 3
Average performance of "marginal" club from each European domestic league, $e(n)$, ranked by UCL performance over 2019-2024 seasons. n represents the number of guaranteed slots as of the 2023-2024 season as well as the rank of the "marginal" club in each league.

Country league	$e(n)$	n
England	100.0	4
Italy	89.0	4
Spain	87.0	5
Portugal	85.0	2
Netherlands	78.0	1
France	65.0	2
Germany	63.0	4
Ukraine	59.0	1
Austria	50.0	1
Belgium	49.0	0
Denmark	28.0	0
Turkey	24.0	0
Russia	22.0	0
Greece	20.0	0
Croatia	15.0	0
Switzerland	15.0	0
Scotland	11.0	1
Serbia	11.0	1
Czechia	10.0	0
Moldova	9.0	0
Israel	6.0	0
Hungary	5.0	0
Sweden	5.0	0

rule, so that one of these leagues would be taken their guaranteed slot away and that slot would be granted to the club ranked 5th in the EPL.

During the first seasons of application of the above rule, we would expect top leagues to increase their number of guaranteed slots. Eventually, we would reach some sort of an equilibrium. One way to get a "back-of-the-envelope" estimate of what that equilibrium might be is to proceed as follows:

- For each domestic league, we compute expected performance of the league winner based on past performance

Table 4
Estimated equilibrium number of guaranteed slots

Country	*n*
England	8
Spain	7
Germany	5
Italy	5
France	0
Netherlands	0
Portugal	0

- For the remaining teams in a given league, we assume expected performance drops with rank according to the slope estimated in the second equation in Table 2

Considering that the total number of guaranteed slots is 26 out of the total 32 (as in the 2023-2024 season), we determine the distribution of guaranteed slots by equating marginal performance while satisfying the adding-up constraint. The results can be seen in Table 4. All countries not listed in Table 4 would be allocated zero guaranteed slots.

While the above proposals would bring us closer to sporting merit, it does not go all the way. Specifically, in the above we have assumed that the total number of guaranteed slots is fixed. As suggested by Table 2, when ranking countries by "marginal" club performance, the bottom country is likely to be a country with zero guaranteed slots. According to the above proposal, this would require taking a guaranteed slot away from a country with a higher marginal performance coefficient. This is contrary to a pure sporting merit approach. A mechanism that would be more in line with pure sporting merit would imply that the number of play-in slots be reduced by one whenever the lowest performance country is a country with zero slots.

7. Conclusion

The UCL format was fundamentally changed as of the 2024/25 season (UEFA, 2022). The reform explicitly aimed to improve competitive balance by replacing the traditional group stage with a league phase (Gyimesi, 2024). Notwithstanding these changes, we believe the issue of cross-league fairness in access remains a valid issue, and so does our analysis — even if the data are based on the previous format.

When announcing the recent changes, UEFA stressed the importance of "qualification based on sporting merit." However, we note that there was also a reference to the "solidarity-based European sports model" as well as the fact that the changes resulted from "a unanimous decision of the UEFA Executive Committee." In fact, our empirical analysis is consistent with the idea that selection into the UCL is not solely based on sporting merit. We believe it is important to acknowledge the merit-solidarity trade-off explicitly. Our paper provides a step in that direction.

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