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Uncertainty of outcome and financial inequality: Is the obvious not so obvious?

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Abstract

The article reports a series of regressions between various proxies for financial inequality and uncertainty of outcome in English football. The main finding is that no significant association between these two variables are identified. Potential alternative explanatory factors for uncertainty of outcome are also discussed, and a significant association between corruption and uncertainty of outcome is identified.

JEL classification: Z20, Z21, Z23
Keywords: Uncertainty of outcome, Financial inequality, European football, Gini index, Corruption index

1 Introduction

Uncertainty of outcome (UO) is a concept that have gained a lot of interest in Sport Management/Economics research, see for instance Borland and Macdonald (2003). The original hypothesis introduced by Rottenberg (1956), states that demand for sport contests depends positively on uncertainty related to the outcome of the contest. That is, if the audience know the outcome of a football game, the interest (or willingness to pay) for watching it decreases.

The fact that this hypothesis is plausible, and more importantly, that it introduces a key difference between sport and other more "normal economic activities", may be seen as an explanation of why this hypothesis has gained such awareness among researchers. The fact that the hypothesis has been hard to "prove", see e.g. Szymanski (2001, 2009), has perhaps also contributed to its popularity.

However, the focus of this contribution is not related to the classical UO-hypothesis. Here, UO itself, and its potential drivers are put under debate.

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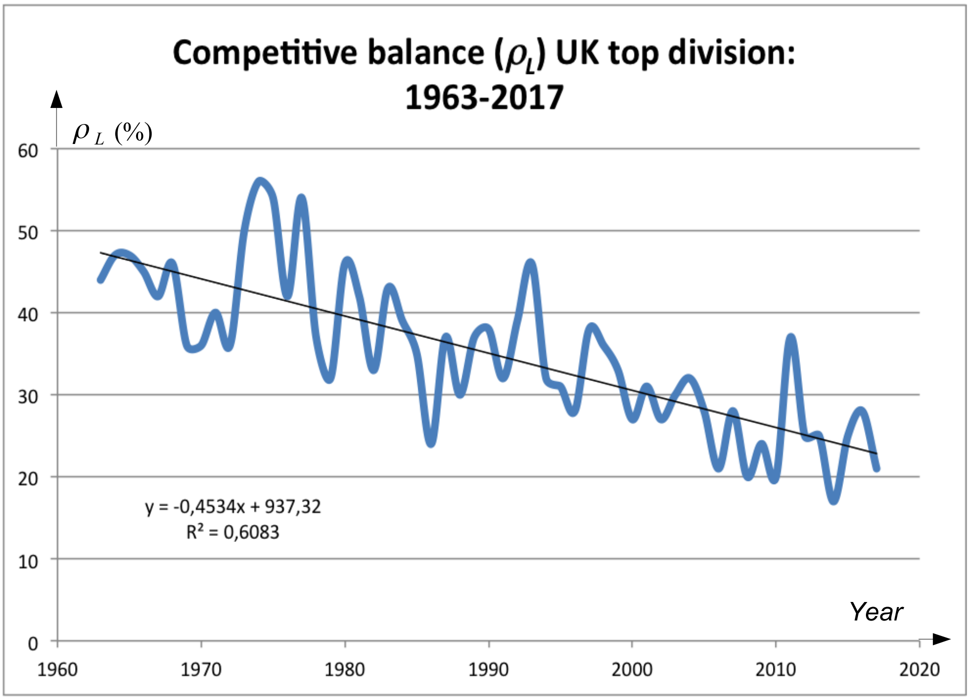

Figure 1: Development of UO in Premier League over the last 50+ years

Figure 1, taken from Haugen and Heen (2018), shows the development of UO in English Premier League for the time period 1963 to 2017[1].

As Figure 1 clearly indicates, a downward sloping trend is identified. Numerically, UO has decreased significantly, from around 50% in the sixties to around 20% as of today. The main question for discussion in this paper is why. Why has excitement in European top football leagues, here exemplified by Premier League[2], shown such a negative development over time? In forthcoming sections 2 and 3, I will try to shed some light on possible answers through some simple empirical analyses. Section 4 concludes.

[1] Refer for instance to Haugen and Heen (2018) for an explanation of the UO-measure, ρ_L used, as well as the data used in the estimation.

[2] As shown by Haugen and Heen (2018), similar patterns exist in Spain, Germany and Italy

2 Various empirical tests for the "obvious"

Financial inequality among European football clubs has increased significantly over the last 50-year period. The main drivers behind this development have been the introduction of new European top leagues, UEFA Champions League as well as Europa League who have increased the revenues of the best clubs. Furthermore, improved TV-deals have had the tendency to increase revenue for the best clubs more than the less good clubs. An indication of this development is shown in Lago, Simmons, and Szymanski (2006), where a more than 200% increase in Premier League revenues is reported between 1996 and 2003. Finally, tremendous growth in sales of sport licensed products has shown a similar relative tendency – the rich clubs get richer, while the poor clubs get poorer – revenue-wise. See for instance Miller (2016) who reports 1,75 million Manchester United shirts (averaged per year over the 2011-2016 seasons) sold, while Tottenham Hotspurs in comparison sold only 268,000 shirts.

The path from the financial inequality trend mentioned above to an explanation of decreased UO, as demonstrated in Figure 1, seems short. After all, if the best clubs get richer and the poor clubs get poorer (relatively), one might expect a growing distance between these two sets of clubs – performance-wise.

It is expressed quite clearly by Szymanski (2001) in *(i)*: (quote)

> "*Thus, the received opinion contains two logical steps: (i) increasing income inequality tends to reduce competitive balance and (ii) competitive imbalance tends to reduce fan interest*."

An interesting theoretical contribution by Sass (2012) predicts the same, directly linking UO and financial inequality in a dynamic league equilibrium model.

However, increased financial inequality in favor of the big clubs (revenue-wise), does not necessarily mean the same profit-wise. As shown by Hamil and Walters (2010); in spite of the dramatic increase in revenues, as well as unequal distribution of these revenues, profits for all clubs show no sign of improvement. That is, costs must have been increasing, in a pattern quite similar to the changed pattern of revenues. As such, it is actually hard to claim that the big clubs like Manchester United or Barcelona have been able to convert the increased revenues into improved bottom line results. Could it even be that the increase in revenues only are converted into new players, perhaps not necessarily better than the players already present? Could it be that this revenue increaser is "eaten up" by the best clubs being locked into a set of "Prisoner's dilemma-like" games, forced to overspend this revenue on the same players they bought relatively cheap previously? An interesting contribution arguing like this can be found in Haugen and Solberg (2010).

That is, it may be argued either that financial inequality leads to decreased UO, or actually no impact on UO at all. As a consequence, it seems relevant to try to test this potential association empirically. After all, if financial inequality has little or no impact on UO, it is one thing less to worry about for sport managers.

So, I decided to conduct some empirical tests aiming to establish whether financial inequality does affect UO. The first part of these tests is performed in a cross-sectional study, including estimation of UO for a reasonably high amount[3] of European top football leagues, and testing through simple regression whether various financial proxies indicate association. All relevant data are given in Appendix A, subsection A.1.

[3] European countries without any form of play-off mechanisms (among the best teams) in the leagues were chosen, as play-off systems disturb UO estimation significantly.

Table 1: Regression analyses with UO (ρ_L) as independent and various alternatives as dependent variable ($DV \in$ {FIFA-rank, CLM, WAGE2014}). That is, $\rho^i_L = \beta_0 + \beta_1 \cdot DV_i + \varepsilon_i$. All estimation and tests performed with the R-package, see R Core Team (2013)

Dependent	Coefficient	Estimate ^{a}	t Value
FIFA-rank	β_0	24.88207***	9.636
	β_1	0.03196	0.533
CLM	β_0	27.37080***	16.578
	β_1	-0.02271	-1.552
WAGE2014	β_0	27.05200***	16.133
	β_1	-2.87300	-1.183

$^{a*}p < .10$. $^{**}p < .05$. $^{***}p < .001$.

Table 1 contains the results of these regressions. The first regression, where the FIFA- rank is dependent variable, assumes that the FIFA-rank might be a proxy for financial inequality. This variable was chosen out of convenience, but it seems reasonable to assume that if a country is high in the FIFA-rank, some notion of financial superiority within the national leagues should be expected. At least should a high FIFA-rank indicate high performance in national championships which has direct positive (and typically not evenly distributed) financial effects for the clubs in the country. Still, this variable is clearly not the sharpest proxy for analyzing the underlying hypothesis.

Anyway, as table 1 indicates, no significant association between UO and FIFA- rank is present in these data.

In order to refine the proxy, a more direct financial variable was picked for the next regression. CLM, meaning direct money transfers from Champions League (as well as Europa League), was tested. Obviously, financial inequality is driven by more components than money transfers from UEFA[4], but as many authors have argued, see for instance Hennig (2011); Scarf and Shi (2008); Szymanski (2010), participation in these tournaments have become increasingly important, financially, for many European top clubs. Furthermore, as opposed to the FIFA-rank, we know that the best and biggest clubs receive this money directly.

Again, as table 1 shows, no significant association.

In the final regression, named WAGE2014, player salaries for each country are used as the dependent variable. Given the observations of Hamil and Walters (2010), of insignificant profits in most clubs, it seems reasonable to assume that player wages might be a good proxy for financial inequality between countries. Still, not even here, any significant association is present.

All the above regressions are cross sectional studies. In reality, it should be better to perform empirics within a league, instead of between leagues or countries. As a consequence, a new longitudinal regression was performed again with UO as independent variable, but with the Gini index of wages, refer for instance to Atkinson (1970), as dependent variable. Based on wage data collected for various years in Premier League, corresponding Gini indexes are calculated. Refer to Appendix A, subsection A.2 for the data. Figure 2 shows a plot of the calculated Gini index for the time period of available data.

[4] Gate receipts, Sponsorships, Sale of sport licensed products and TV-deals to name a few.

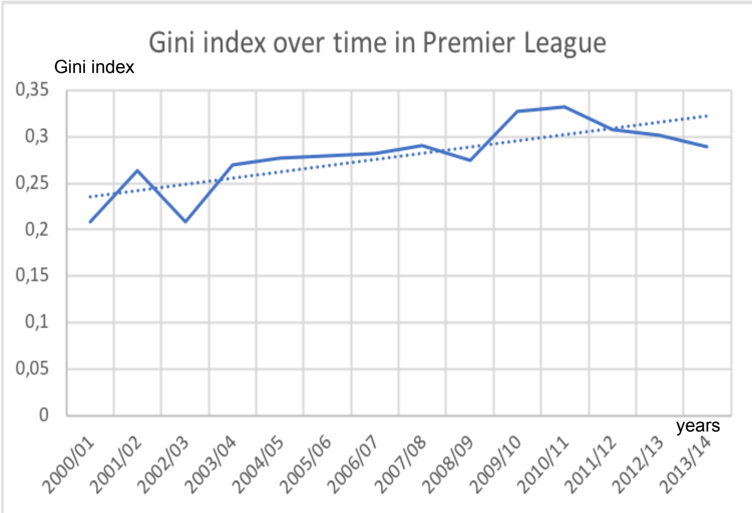

Figure 2: Development of Gini index in Premier League – 2000/01 to 2013/14 seasons

Figure 2 indicates that the Gini index is increasing over the given time period. It turns out that the linear trend shown in the figure is significant as well (at the 99% level). That is, financial inequality (measured by the Gini index) in Premier League was increasing (significantly) between 2000/01 and 2013/14 seasons.

Results from a regression where UO is independent and Gini index is dependent variable are shown in table 2.

Table 2: Regression analyses with UO (ρ_L) as independent and the Gini index as dependent variable.

Dependent	Coefficient	Estimate ^{a}	t Value
Gini index	β_0	36.18*	3.026
	β_1	-36.17	-0.852

$^{a}{*}p < .10.$ $^{**}p < .05.$ $^{***}p < .001.$

Even though the direction of the potential association is correct (β_1 is negative), the estimate is far from significant. As a consequence, none of the regressions indicate any association between UO and financial inequality.

3 What does affect uncertainty of outcome?

As the discussion in the previous section has indicated, it must be other explanations than the popular one – increased financial inequality – that have driven the excitement of European top football downwards. The question in the heading is of course a difficult one to answer, but I will at least try to formulate some possible causes.

Literature has some hints to offer. Haugen (2008) performs a limited empirical analysis on the change of UO after the introduction of the 3-1-0 point score system. He claims (and argues logically through game theory) that this change may have affected UO adversely (led to a reduction). Still, the clear ongoing

negative trend (for more than fifty years) as observed in Figure 1, cannot be explained by this single change in the eighties.
However, other rule changes have been introduced, both before and after the change in point score system. For instance, changes in the off-side and penalty-kick rules as well as a denial for the goal keeper to use hands when a return is made. This last one is especially interesting. The original underlying reasoning was to avoid boring keeper returns. This rule change has not reduced returns to the keeper, at least not observed on my TV-screen. On the contrary, the keeper has become a much more important player, using his feet in a radical new way; both offensively and defensively. Presumably, if the best teams have better keepers than the less good teams, such changes impose a benefit for the best teams, again stimulating a decrease in UO. Much of the changes in the rules, aimed at removing boring parts of the game may have adverse consequences on UO. Hence, a closer look into this area may be of interest.
Another quite different topic is corruption. Wagering or betting markets are, although different, closely related to most sports, football included. Se for instance Forrest (2006); Forrest and Simmons (2003) for an in-depth description of this link.

A fundamental fact concerning these markets are that odds, and especially high odds, have a stimulating demand effect. Odds are closely linked to probabilities and will grow for the non-favorite with an increasing probability for a win for the favorite. As such, it seems obvious that low UO is critically important for high wagering demand. This holds for both honest as well as dis- honest (match fixing) gamblers. Hence, if a certain sport draws benefits from a lively betting market, a low UO may be an output which works. Low UO characterizes (logically) a league where betting is high. Obviously, the dishonest gamblers, the match-fixers, would be especially eager if the league is imbalanced (low UO) as the odds would then be high.
Based on the above arguments, a hypothesis regarding a positive association between low UO and high corruption seems plausible. That is, if some data containing amounts of corruption related to various countries, say the corruption index[5] is regressed against UO, we might find a significant association.
Indeed, this is the case, as shown by table 3.

[5] Refer to: https://www.transparency.org/research/cpi/overview. The data used here (named CI) are also included in Appendix A, subsection A1 in table 4.

Table 3: Regression analyses with UO (ρ_L) as independent and the Corruption index as dependent variable.

Dependent	Coefficient	Estimate ^{a}	t Value
Corruption index	β_0	37.6852^{**}	2.939
	β_1	0.9915^{*}	2.085

$^{a*}p < .10.\ ^{**}p < .05.\ ^{***}p < .001.$

4 Conclusions

My main and most interest finding in this paper, is the lack of association between various variables used as proxies for financial inequality and UO. This is contradictory to mainstream thinking and given that my (limited) empirical evidence indicates reality, it ought to be important. This is because if UO is not driven by financial inequality, the necessity to regulate financial inequality is limited. There is no doubt that a growing concern related high, and unequally distributed, player transfers and wages has emerged the latter years, and several practitioners as well as experts have argued that more financial equality may be a cure. My empirical evidence disputes this.

If financial inequality has no or limited impact on UO, then various regulative means like for instance endless quarrels on the fairness of TV-money distribution may be a waste of time. Not to speak about UEFA Fair play constraints who may have little or no importance what so ever. If the system forces the rich clubs to be trapped in games where their financial strength does not pay in the conversion to playing strength, then we could spend far less resources on discussing these topics.

The fact that I was able to show that corruption was significantly associated with UO may be important, although I personally is quite insecure on whether this variable actually is that relevant. Still, the empirical evidence is there, and should perhaps be investigated further.

In any case, the understanding of the development of UO, alone or as a consequence of other instruments is relevant. If the development illustrated in Figure 1 will continue, most would agree that the football business might experience severe demand problems in the future. After all, sporting contests with predictable results will in the long run fail to engage audiences.

Appendix A Data used in the empirical analyses

A.1 The cross-sectional study

Table 4 contains data used in the analyses leading up to the results in table 1.

Table 4: Data used in the (cross sectional) empirical analyses.

	UO (ρ_L)	FIFA-rank	CLM	WAGE2014	CI
Norway	38.8	49	0.000	0.12	85
England	21.0	13	301.780	2,27	82
Germany	30.9	1	204.206	1.46	81
Italy	16.4	20	231.905	1.31	50
Spain	16.4	8	281.099	1.21	57
Sweden	28.0	23	0.000	0.09	84
Finland	30.3	63	0.000	0.00	85
France	27.9	7	192.554	0.99	70
Portugal	23.6	4	83.008	0.26	63
Holland	24.8	19	49.425	0.23	82
Switzerland	28.9	6	25.372	0.24	85
Austria	34.2	26	15.835	0.18	75
Greece	21.4	44	18.619	0.15	48
Croatia	10.1	18	0.000	0.05	49
Albania	28.0	56	0.000	0.00	38
Bosnia & Herc.	19.5	41	0.000	0.00	38
Belarus	15.1	79	0.000	0.00	44
Ireland	25.9	31	3.000	0.00	74
Iceland	35.1	22	0.000	0.00	77
Luxembourg	26.8	83	0.000	0.00	82
Macedonia	25.6	77	0.000	0.00	35
Slovenia	29.6	65	0.000	0.00	61
Czech. Rep.	25.2	45	16.256	0.00	57
Turkey	26.6	37	68.609	0.45	40
Hungary	40.3	50	0 .000	0.00	45

All data except The FIFA rank, picked from May 2018 and wages (WAGE2014), picked from the 2013/2014 season, are picked from the 2016/2017 or 2017 seasons. All data, except ρ_L, are picked from open internet sources like: www.altomfotball.no, www.fifa.com, www.uefa.com, www.transparency.org and www.deadspin.com. ρ_L is calculated by

$$\rho_L = \frac{\sum_{i=1}^{\frac{N}{2}+1} (AP_i - LCP_i)^2}{\sum_{i=1}^{\frac{N}{2}+1} (MCP - LCP_i)^2}$$

Where N is the number of matches played in the league, AP_i is the point score achieved by team i on the final table, LCP_i is the point score achieved by team i if the league is maximally imbalanced, and MCP is the point score achieved by team i if the league is maximally balanced. Refer for instance to Haugen (2008) or Haugen and Heen (2018) for further information.

A.2 The longitudinal study

Table 5: Data used in the longitudinal empirical analysis.

Season	ρ_L	Gini index[a]
2000/01	31	0.209
2001/02	27	0.263
2002/03	30	0.208
2003/04	32	0.270
2004/05	28	0.277
2005/06	21	0.280
2006/07	28	0.282
2007/08	20	0.291
2008/09	24	0.274
2009/10	20	0.327
2010/11	37	0.332
2011/12	25	0.308
2012/13	25	0.302
2013/14	17	0.289

[a]Wage data underlying the Gini index captured from Quilty-Harper, Bowater, Oliver, and Palmer (2012), Harris (2011), Conn (2013), Conn (2014). The Gini index was calculated by $\frac{2\sum iy_i}{n\sum y_i} - \frac{n+1}{n}$, see also Atkinson (1970).

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