



European Journal of Government and Economics

Vol.9 • No.2
2020
ISSN: 2254-7088

Special Issue. The Role of Institutions and Governance in Sport



Servizo de Publicacións
UNIVERSIDADE DA CORUÑA



Number 9, issue 2, June 2020

Special Issue. The Role of Institutions and Governance in Sport

DOI: <https://doi.org/10.17979/ejge.2020.9.2>

-
- How the UEFA Financial Fair Play regulations affect to football clubs' priorities and leagues' competitive balance?** 119-142
DOI: <https://doi.org/10.17979/ejge.2020.9.2.5842>
Pedro Garcia-del-Barrio and Giambattista Rossi
- Surveys assessing sports services and municipal governance** 143-154
DOI: <https://doi.org/10.17979/ejge.2020.9.2.5949>
Júlia Bosch, Laureà Fanega, Jaume García, Núria Hernández, Xavier Moya, and Carles Murillo
- Evaluation of the perceived social impacts of the Formula E Grand Prix of Santiago de Chile** 155-169
DOI: <https://doi.org/10.17979/ejge.2020.9.2.5850>
David Parra-Camacho, Daniel Michel Duclos Bastías, Frano Giakoni Ramírez, and Samuel López-Carril
- Comparative analysis of income trends and perceived value of squad of the highest turnover European football clubs (2010-2019)** 170-180
DOI: <https://doi.org/10.17979/ejge.2020.9.2.5953>
Benito Pérez-González, Luis de la Riva, José Bonal, and Álvaro Fernández-Luna
- Analysis of loyalty and future intentions of the users of the golf courses in Andalusia, Spain** 181-199
DOI: <https://doi.org/10.17979/ejge.2020.9.2.5841>
Marcos Pradas García, María José Maciá Andreu, Marta García-Tascón, and Ana María Gallardo Guerrero
- Female leadership in sports clubs** 200-209
DOI: <https://doi.org/10.17979/ejge.2020.9.2.5840>
Alfonso Martínez-Moreno, Francisco Cavas-García, Francisco Cano-Noguera, and Arturo Díaz-Suárez
- The profile of leisure time sports people and their reason for doing sport in Spanish sports facilities** 210-219
DOI: <https://doi.org/10.17979/ejge.2020.9.2.5846>
Moisés Grimaldi-Puyana, Pablo Gálvez-Ruiz, Manel Valcarce-Torrente, and Ainara Bernal-García



How the UEFA Financial Fair Play regulations affect football clubs' priorities and leagues' competitive balance?

Pedro Garcia-del-Barrio^{a*}, Giambattista Rossi^b

^a Universitat Internacional de Catalunya, Spain

^b Birkbeck University of London, United Kingdom

* Corresponding author at: pgarcia@uic.es

Article history. Received 14 December 2019; first revision required 23 January 2020; accepted 20 February 2020.

Abstract. Institutional and legal reforms applied in the context of sports competitions often provoke structural changes that can be empirically investigated. Using a data set of 560 observations (20 teams per season, from 2009/10 to 2015/16, of teams playing in the Premier League, La Liga, Serie A and Ligue 1), this paper examines how the UEFA Financial Fair Play (FFP) regulations may have altered the football clubs' decisions concerning their sport and financial priorities. Moreover, based on a simple theoretical description, the paper shows that the increasing financial stability promoted by the FFP rules might actually imply – as an undesired side effect – a declined competitive balance affecting the European football leagues. Finally, the paper discusses some policy issues and recommendations.

Keywords. institutional regulations; professional football; financial fair play; competitive balance; wage-to-revenue ratios

JEL Codes. D22; J24; J33

DOI. <https://doi.org/10.17979/ejge.2020.9.2.5842>

1. Introduction and purpose

This paper focuses on the impact that the introduction of the UEFA¹ Financial Fair Play (FFP) regulations may have had on the football clubs' priorities concerning their sport and financial outcomes. This feature is critical since, among other things, the increasing financial stability produced by the FFP rules could eventually entail – as an undesired side effect – a declined competitive balance across the football teams competing in European leagues.

Institutional and legal reforms affecting sports competitions typically generate structural changes that can be empirically investigated. Examples of such reforms in the context of European professional football include: (i) the re-design in season 1992/93 of the competitive structure of the UEFA Champions League; (ii) the so-called *Bosman law* introduced in December 1995; and (iii) changes in the bargaining system (individual/collective) of broadcasting contracts.

There are various objectives that this paper tries to achieve. First, it re-examines the findings of earlier works, that we mention later in the paper, by conducting an empirical analysis over

¹ The UEFA, *Union of European Football Associations*, is the governing body of European football. In this paper, “club” and “team” are often used indifferently.

four leagues (Premier League, La Liga, Serie A and Ligue 1) and 7 seasons (2009/10 to 2015/16), thereby resulting in a data set of 560 observations (20 teams per league and season). Specifically, our analysis verifies the existence of a positive relationship between (i) spending in players' talent – the clubs' wage bill – and sports achievements; and between (ii) teams' sporting success and teams' revenues. Second, we study the effects that the approval of new rules, on the part of the football regulatory institutions, may have in altering the clubs' decisions regarding both sport performances and financial outcomes. Specifically, we explore empirically the existence of structural changes resulting from the reform imposed by the UEFA FFP regulations, which are intended to create a more sustainable financial situation in European football.

To accomplish the papers' goals, we carry out several empirical analyses: (i) to verify if the evidence supports that the FFP regulations reduce the Wage-to-Revenue Ratios (WRR) and their dispersion; (ii) to identify what domestic leagues were more sensitive to changes in the FFP rules (evidence of structural breaks); and (iii) to study if the FFP regulations will help to limit wage inflation² while preserving the overall investment in talent.

Finally, we discuss the implications that the new FFP rules may have, along with its effects in terms of the WRR, on the Competitive Balance (CB) of European football leagues. The latter aspect is prospectively addressed by means of a simple theoretical elaboration, which shows how the increasing financial stability procured by the FFP rules is likely to deteriorate the current leagues' CB. Accordingly, we wonder if revenue sharing regulations should be imposed along with the FFP rules to prevent the deterioration of CB in the leagues.

2. Related literature

The broad scope of the paper recommends referring to several fields of related literature. First, following earlier works (Cf.: Szymanski and Smith (1997); Forrest and Simmons (2002); and Barajas and Rodriguez (2010), among others), our empirical analysis corroborates the existence of a positive relationship between wage spending in players' (as a proxy of the level of the teams' talent) and sport achievements. In line also with the analysis made by Szymanski and Smith (1997), we find as well the usual positive and statistically significant correlation between teams' sport success and annual revenues. The other bibliographical references are grouped in two areas: contributions related to the FFP literature and papers on superstar players and overinvestment.

² Contracts to hire football players are undoubtedly influenced by the link between wage bills and transfer fees. This feature is especially relevant in front of the inflation that seems to affect more intensively the transfer fees of superstar players. It may be that transfer fees of the "average" players have not been so much affected by inflation as they are the transfer fees of players at the top of the talent distribution function.

2.1. Super-star players and overinvestment in talent

Given the link between the club's spending on sport ability and the resulting wage bill, our study also relates to the issue of talent investment to hire players. Garcia-del-Barrio (2018) and Garcia-del-Barrio and Pujol (2020) show the necessity of the teams to account for popularity and media visibility status, along with sporting skills, when facing hiring (investment) decisions on talent. Pawlowski and Anders (2012) stress the role of brand investments, which is the result of people showing a preference for strong brands and sport superstars. Rohde and Breuer (2016) empirically examine a number of European clubs and find that their financial success is driven by brand value as well as by sporting success; i.e. sporting achievements are determined by the amount of investment. Then, Aguiar-Noury and Garcia-del-Barrio (2019) provide empirical evidence to advocate that the historical brand status of football clubs has to be taken into account for reducing the risk typically associated to investments in the sports industry.

Besides, Football clubs are usually prone to sacrifice economic returns to improve their (short-run) sport achievements. Hence, given these perplexing incentives, it is not surprising the advent of mismanagement in the form of over-investment in talent (excessive wage spending). In this context, Dietl et al. (2011) study investment in talent to explore how it depends on whether the clubs are more or less win-oriented. Overinvestment and revenue dissipation in sports are also treated in the economic literature. (Cf.: Dietl et al. (2008); and Franck (2014)³). Although spending in sport talent is investment decision, which is meant to procure future gains, attempts are made to keep excessive rewards (wage bills) under control; for instance, by the institution of salary caps in some American leagues. Other regulations on sport institutions were implemented to try fostering competitive balance; examples in the context of the labour market include: amateur drafts and free agency restrictions (Caporale and Collier, 2015).

Another issue related to our topic is the escalating spending involving the decisions of firms' operating in the same sector. The arms race phenomenon arises in many contexts, including advertising campaigns, where companies try to gain market share from the other companies. But then, the competitors engage in the battle, as they face the prospect of losing market share. As a result, there is excessive unnecessary use of economic resources, given that the crucial issue is the relative rather than the absolute level of investment.

Regarding football, the issue is described in the following quote from Andreff (2012):

"The promotion/relegation system and win maximization pave the way to a clubs' arm race (Sanderson, 2002) in which each club attempts to recruit the best players on the eve of season in order to improve its relative situation compared with its opponents; in turn, the latter are incited to overbid. Thus, each club's demand for talent is excessive because all clubs aim at winning the same sports contest. However, investing in additional player recruitment is not efficient when a club attempts by all allowed means to have an advantage

³ Cf.: Franck (2014, p. 6): "*Football championship races are examples of a certain form of economic competition, which is known as contest in the literature (...). Even if we assume rational behaviour and profit maximizing clubs, contests may exhibit an interesting phenomenon of revenue dissipation called overinvestment.*" Because football leagues are good examples of contests, their analysis can benefit from the contest's theory: Tullock (1980), Lazear and Rosen (1981).

over its opponents because, consequently, all clubs are then forced to behave in the same way in order to remain competitive. Such investment is socially efficient only if absolute quality (and not relative quality as in a game between two teams) considerations prevail (Lazear and Rosen, 1981). There are only a few winners (promoted clubs, those qualifying in a European level contest) in the arms race while cost increases – wage and transfer fee inflation – are all the more generalized across all clubs and so they are not slowed down by profit maximization” (p. 96).

Backman (1968) points out how economists typically advocate that advertising involves a wasteful of resources. The argument is that the very same market share would eventually result had competitor firms agreed on a coordinated reduction of excessive expending in activities like advertising or payrolls.

Actually, given its inner competitive nature, sport contests are paradigmatic examples where “arms races” can eventually develop into football clubs’ waste of resources. Moreover, this phenomenon is especially relevant in the context of the prevailing patterns at hiring talent in sports labour markets. Notice that we are not referring here to exactly the same phenomenon than the “College Athletics Arms Race” (Cf.: Edwards, 1984),⁴ since even if spending decisions are usually made while taking into account their rivals’ behaviours, universities are bonded by explicit rules that forbid them to compete for hiring new talented players on prices basis. To examine this issue, we explore if deviations from the average wage of domestic competitors works better than absolute values, implying that what matters the most is the comparative position of one team relative to the others. Actually, researchers often model behavioural wage equations (the relationship between individual salaries and performances) on the bases of their position with respect to other rivals, rather than on absolute values. (Cf.: Torgler and Schmidt (2007); Peeters and Szymanski (2014); Caporale and Collier (2015); and Garcia-del-Barrio and Tena-Horrillo (2019)).

2.2. The UEFA “Financial Fair Play” in the literature

In this paper we explore how football clubs’ priorities and objectives may be affected by institutional and legal reforms. Our analysis is actually going to focus on the impact provoked by the FFP regulations introduced by UEFA to prevent clubs from spending beyond their economic means. The FFP rules, introduced to promote clubs’ financial discipline and stability, were approved in September 2009, but they were only fully implemented in 2011. Since then, for the clubs to be allowed to participate in UEFA competitions, they must prove having no unpaid

⁴ Competition among university colleges have developed intense commercial battles (arms races) beyond the sporting field. In recent years, there have been an increasing number of papers addressing the issue of “arms races” in College athletics: Cf.: Litan et al. (2003); Orszag and Orszag (2005); Orszag and Israel (2009); Tsitsos and Nixon II (2012); Hoffer et al. (2014); Caro and Elder (2017); etc. The first mentioned paper identifies relevant industries where the arms races have become paradigmatic: the purchase of “weapons arms races” in the defences industry or “medical arms races” in hospitals (health industry). Similarly, in the context of sport inter-colleges competitions, investing in sport facilities are described as “athletics arms races”. Litan et al. (2003) also refer to the beginning of an “arms race” specific to football and basketball, as increasing revenues and capital investments provide financially support to improved programs to hire and maintain gifted athletes and coaches.

debts affecting other clubs or tax authorities. The UEFA first delivering of FFP ruling was made in April based on the clubs' accounts of seasons 2011/12 and 2012/13.

In order to enforce clubs to balance their wage spending with respect to revenues, and to prevent them of accumulating excessive debt, UEFA implemented in 2013 a financial ruling: the break-even requirement.⁵ It was not until May 2014 that UEFA imposed the first sanctions to clubs failing to fulfil the break-even requirements and, hence, the first conditions stemming from the non-compliance of those requirements were actually at work for the first time in the 2014/15 season.

Franck (2014) discusses the effects of the FFP regulations, expressing a concern about the new rules due to several reasons. First, since imposing limits to wage spending (like the salary caps, a common institution in US professional leagues) is usually made to the aim of enhancing the CB (Cf.: Peeters and Szymanski, 2014).⁶ Second, given that, as stressed by Vöpel (2011), the UEFA regulations may create entry barrier that will further consolidate the current hierarchy of European clubs: the richest clubs become richer and the poorest become poorer. Following Madden (2015), Franck (2014) also alert that FFP rules may be associated to forgone earnings from the "external" resources that could have otherwise expanded the clubs' payrolls.

To our knowledge, there are still few papers focused specifically on studying the impact of the break-even requirement imposed by FFP rules on clubs' actual WRR. Heiskanen (2017) finds that football clubs are now more disposed to be financially responsible and the FFP regulations have led to smaller WRR (mainly in the Premier League and Spanish La Liga), a result that also applies to teams that did not qualify to participate in the UEFA's competitions. Ghio et al. (2019) study the effect of FFP rules on the Italian calcio empirically. Their paper focusses on how these rules affect the clubs' cost efficiency regarding the trade-off between sporting and economic outcomes, and find that the FFP does not improve the average efficiency of Italian teams.

Gallagher and Quinn (2019) empirically study the effect of the breakeven financial constraints on the joint sporting and financial efficiency of 60 English football clubs for the period running from 2003/2004 to 2016/2017. Using a stochastic non-parametric efficiency analysis, they find that the breakeven rules bring forth reductions in the clubs' efficiency (on average), and that UEFA financial regulations may force clubs to grant prior attention to the financial achievements, thereby weaken the future competitive intensity in English football.⁷

In line with Heiskanen (2017), one of our paper's aims is also identifying changes in WRR due to the introduction of the FFP regulations. However, our paper has a broader scope for two reasons. First, it develops the empirical analysis on a richer data set – involving more teams

⁵ Besides, an independent entity, the Club Financial Control Body (CFCB), was set up to supervise the fulfilment of the FFP regulations and clubs' licensing system. To fulfil their role, the CFCB evaluates financial figures of the last three seasons for all clubs in UEFA competitions. The punishments imposed by UEFA include economic penalizations, but also: transfer bans, warnings, points deductions, ban to register new players and restrictions on the number of players registered to participate in European competitions, etc.

⁶ However, gains in competitive balance by introducing the new FFP rules seems not to be expected. Moreover, this paper argues that the FFP regulations are likely to deteriorate the future competitive balance of European football leagues.

⁷ Notice that our paper does not focus on overall competitive intensity analyzed by these authors, but on the fact that the FFP regulations may presumably diminish the quality of the competitions through undermining of the actual competitive balance of teams competing in both domestic and European leagues.

and years – and, second, it examines how the new rules might have affected the clubs' priorities concerning sport and financial achievements.⁸

The final part of the paper focuses on the implications that the new FFP regulations and their effect in reducing the WRR across football clubs might have on the European leagues (un)competitive balance. The issue of competitive balance (CB) and its link to the “outcome uncertainty” (OU) hypothesis was studied right from the birth of sports economics. The contributions by Rottenberg (1956) and Neale (1964) are considered seminal papers. Since then, other papers have studied the issues of CB and the OU hypothesis, and the way they are related to each other (Cf.: Owen (2014), among others). Regarding the empirical studies, there is no agreement on the relevance of the OU hypothesis, given that contrasting empirical evidence is found when studying how CB influences the degree of interest in sports. (Cf., for instance: Garcia and Rodriguez (2002) and Coates and Humphreys (2012)).

As a final remark, we suggest that the introduction of revenue sharing mechanisms could smooth out the otherwise deteriorating degree of CB across teams in European football leagues. Indeed, revenue sharing is already at work, especially in the context of broadcasting revenues. This point is precisely congruent with a Spanish law, introduced in 2015, enforcing football clubs in La Liga to grant their individual rights for joint commercialization and establishing that 50% of the revenues of the first division league must be shared in equal proportions among the 20 teams.⁹

Our study contributes to filling a gap in the literature as it benefits from a very rich database. Moreover, our approach to these topics is made keeping in mind the trade-off between win and profit maximising behaviour of football clubs described in the economic literature.

3. Methods and data sources

The empirical analysis is made upon data at the club level. The estimated models involve two financial variables: annual revenues (R_{it}) and annual wages (W_{it}). Our database comprises all the teams competing in the first division leagues of four out of the five main European competitions: The Premier League, Spanish La Liga, Italian Serie A and French Ligue 1. (Financial data for German teams was unavailable). We have been actually able to gather a data set of 560 observations: 20 teams per league and season, over the period 2009/10 to 2015/16.

Table 1 summarises the descriptive statistics of the main variables employed in this paper and, given the relevance of the WRR, the statistics are also shown by seasons in this case.¹⁰

⁸ Our empirical analysis is conducted, for the period 2009/10 to 2015/16, using a sample of 20 teams in the first division leagues every year, from four of the main football leagues in Europe: Premier League, La Liga, Serie A and Ligue 1. (Data for the German Bundesliga is not available).

⁹ Real Decreto-ley 5/2015, de 30 de abril, de medidas urgentes en relación con la comercialización de los derechos de explotación de contenidos audiovisuales de las competiciones de fútbol profesional (Exposición de Motivos, n.2).

¹⁰ Annual wages and revenues were obtained from: Deloitte “Football Money League” (DFML) and Deloitte “Annual Report of Football Finance” (ARFF) published over the years. Other data was collected from the clubs' accounts or from data bases: SABI, Aida, Amadeus and Hoovers. Due to missing values, the regression analysis was made on 558 or 557 (rather than 560) observations for, respectively, the wages and revenue equations. Due to strong financial

Table 1. Descriptive statistics of the Main Variables.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
% Revenue / Wage (RWR)	557	160.56	39.69	44.75	305.17
% Wage / Revenue (WRR)	557	66.24	17.86	32.76	223.41
Annual Wages (Mill.)	558	67.48	65.02	7.64	371.73
Annual Revenues (Mill.)	557	108.50	115.89	13.42	690.10
UCL Games	560	0.78	1.79	0.00	8.00
EUR Games	560	0.65	1.59	0.00	8.00
Points in Domestic League	560	51.93	16.16	17.00	102.00
League Rank	560	10.50	5.77	1.00	20.00

Wage-to-Rev. Ratio (by season)					
Season	Obs.	Mean	Std. Dev.	Min.	Max.
2009-10	79	18.35	68.72	34.95	144.34
2010-11	79	21.72	70.28	34.56	177.86
2011-12	80	23.65	68.95	35.87	223.41
2012-13	80	15.38	64.88	34.86	128.68
2013-14	80	15.26	63.17	37.61	148.81
2014-15	79	13.19	63.17	32.76	94.51
2015-16	80	13.90	64.54	39.52	106.81

Sources: Deloitte ARFF, Deloitte DFML and authors' own collection from clubs' accounts.

The variable "UCL games" accounts for the number of rounds that teams played in the UEFA Champions league; whereas "EUR games" are the corresponding rounds in the UEFA Europa league. The meaning of the other variables in the table is straightforward.

The first task to be accomplished is examining the patterns behind WRR of clubs across leagues and over time. To this aim, the following section presents a number of plots where, instead of grouping relative frequencies, we deliver the smoother graphical representations that result from estimating Kernel probability density functions (rather than histograms).

4. Disparity in WRR Patterns across Football Leagues

A mere inspection of the available data leads to achieving important conclusions. First, Figure 1 suggests that a turning point altering the WRR might have occurred in season 2013/14, possibly due to the introduction of the FFP regulations by UEFA. (The first release of the FFP ruling was based on the clubs' financial accounts of 2011/12 and 2012/13. Yet, the compliance conditions of the break-even requirements were first adopted in 2014/15).

Comparing the behaviour of WRR in the years prior to introducing the UEFA rules (Kernel density functions in red) and the new prevailing pattern that emerges since then (represented in blue), once the conditions for the compliance of the break-even requirements were adopted for the first time, it seems that a structural break occurred at that time. (The Annex shows a similar Kernel density analysis where each season is treated separately).

difficulties, three clubs failed to publish data on annual revenues in one of the seasons: Portsmouth (Premier League, in 2009/10); Hércules CF (La Liga, in 2010/11); and Parma FC (Serie A, 2014/15); and two of them did not publish either the annual wages: Portsmouth (Premier League, in 2009/10); and Hércules CF (La Liga, in 2010/11).

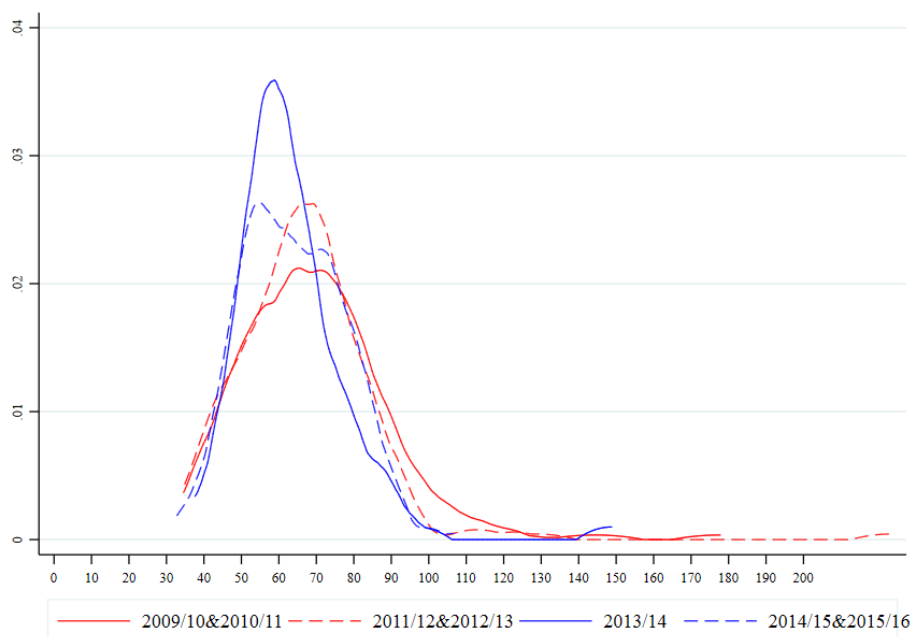


Figure 1. Kernel density functions – Wage-to-Revenue Ratios (Changes over the seasons).

The analysis of WRR in the four mentioned football leagues is also enlightening. Figure 2 shows substantial discrepancies across domestic competitions, where the French Ligue 1 stands out with the highest WRR figures, suggesting that wage inflation is more intense than in the other European leagues. The Italian Serie A appears to be the league with the lowest WRR figures. Notice though that we must be cautious here, as some differences may exist in the way how clubs present their financial accounts across countries. (See for this issue “Note 11”, which describes the sources of data, including the clubs’ accounts and other databases).

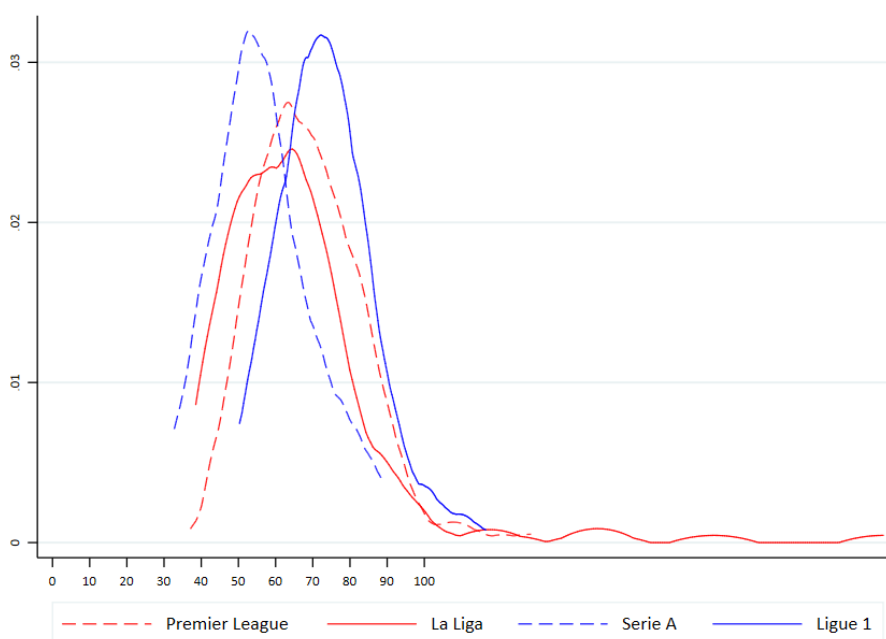


Figure 2. Kernel density functions – Wage-to-Revenue Ratios (by domestic leagues).

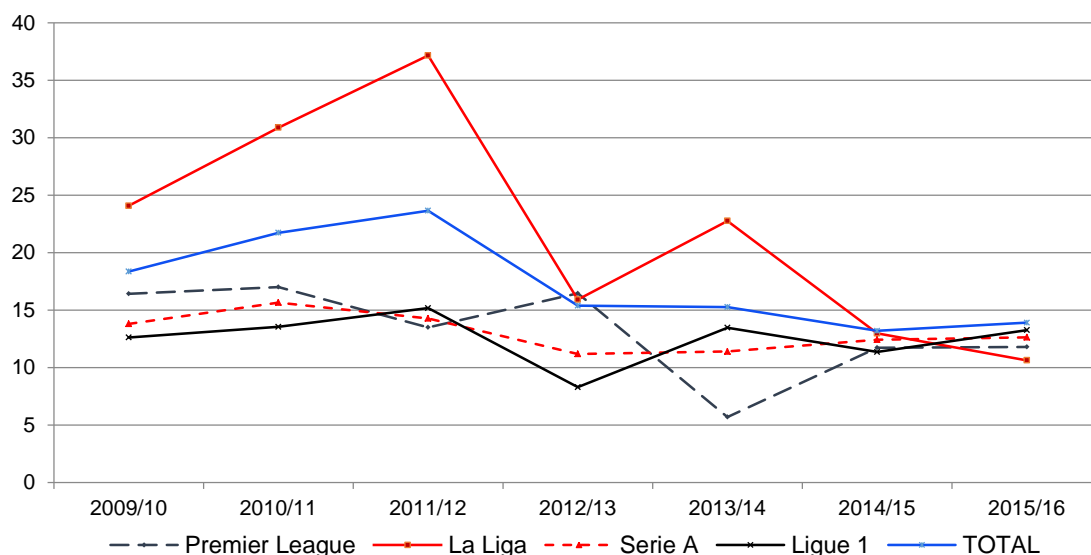


Figure 3. Standard Deviations of Wage-to-Revenue Ratios (by Football Leagues).

A complementary description of the discrepancies across the domestic leagues is shown in Figure 3, which illustrates the evolution of the standard deviations (of each league) over the years, based on the figures previously reported in Table 1. A simple inspection of the figure reveals that the standard deviations converge to similar values. This feature seems to have especially benefited the Spanish La Liga, as it has experienced a diminishing WRR disparity across teams. Besides, the graphical analysis also points towards a possible structural change occurring soon after the introduction of FFP regulations.

For the purpose of our paper, in Figure 4, we also analyse the evolution of WRR standard deviations (Figure 3) to the evolution of the clubs' annual wages. Apart from the Italian Serie A, all the leagues display a growing trend, which suggests general wage inflation. As it is obvious from the WRR evolution, annual revenues increased in line to the wages in the lasts years.

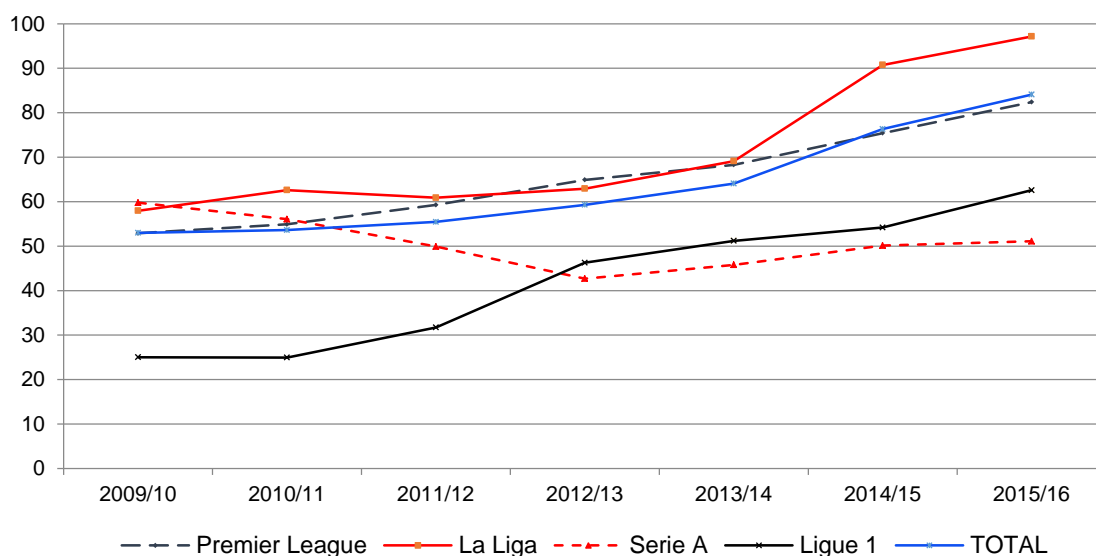


Figure 4. Standard Deviations of Annual Wages (by Football Leagues).

Figure 4 reveals that wage disparity across teams is growing bigger, evidence of increasing financial unbalances, which is often blamed for creating greater sport competitive unbalance too.¹¹ Moreover, the financial imbalance becomes even stronger precisely at the time when the FFP rules were implemented. Nevertheless, as far as the empirical evidence is concerned, the question about the effects of FFP regulations should be examined upon longer data series (on wages and performances) before a more conclusive judgment on this matter is delivered. Anyway, a further and more refined empirical treatment of this issue is carried out in the following section.

Finally, we consider the implications of estimating models with variables in levels or variables expressed in deviations from their mean. On one side, given that what really matters are the relative strengths between adversaries (Cf.: Sanderson 2002), in model estimation the latter option (variables in deviations from the league average) is expected to work better than using variables in absolute values. On the other side, from a theoretical perspective, we also expect – given the nature of sports competitions – that models in deviations from the mean will perform better to explain clubs' behavioural equations than the others.

This point is crucial for judging whether the football labor market makes efficient or inefficient use of its resources. If teams' performances are basically explained by the relative wages (in deviations from the corresponding league's average), then it is a nonsense for clubs wanting to hire talent to engage in "arms races" with other competitors. That is to say, insofar as the relative wages (rather than their absolute values) are the main driving force to achieve sport success, there is increasing risk of unnecessary waste of resources due to bidding along with other competitors to hire sport talent. The empirical analysis of the next section is also helpful to examine this feature and to see to what extent does it affect the football labor market.

5. Empirical analysis and results

This section explores if changes in the behavior and objectives of football clubs may be the result of imposing new institutional regulations. Specifically, our attention focuses on the changing patterns observed in the clubs' WRR (as shown in Section 3), to examine whether they may be due to the implementation of the FFP rules and break-even requirements by UEFA. This empirical analysis would help us to understand to what extent the new financial restrictions might have affected the football clubs' decisions concerning their sport and economic priorities and ultimately their sport and economic outcomes.

To fulfil the aforementioned aims, this empirical section is organised in three main sub-sections. First, we run dynamic regression "Wage-to-Revenue Ratio" models, including a lag of the dependent variable, to try identifying structural changes in WRR patterns (overall and in each of the domestic leagues). Then, we estimate "Revenue equations", where the clubs' annual revenue is defined as a function of sports performances; and, also "Productivity

¹¹ In this regard, see: Szymanski (2006), who in page 201 says: "*inequality in income has translated more or less directly into inequality in the strength of playing squads*". This point is however a matter of discussion. Precisely Szymanski (2006) also stresses that inequality in the playing field seems not to have deteriorated according to the increase in the clubs' financial inequality.

equations”, where sport performances are explained by alternative settings of the football teams’ annual wage bills. Initially, we introduce the two fundamental functions on which the empirical analysis is made, although the discussion of further theoretical aspects is reserved for the next section:

$$R_{it} = f(DSP_{it}, CLP_{it}, EUP_{it}) \quad (1)$$

$$DSP_{it} = g(W_{it}) \quad (2)$$

Where: R_{it} = total annual revenues - club i and season t (millions of €)
 DSP_{it} = domestic sport performance (points) - club i and season t
 CLP_{it} = number of qualifying rounds in the Champions League - club i and season t
 EUP_{it} = number of qualifying rounds in the Europe League - club i and season t
 W_{it} = total annual wages - club i and season t (millions of €)

First, equation (1) postulates a positive empirical relation between annual revenues and sport performances, by taking into account the domestic games but also the sport achievements in European competitions. Domestic sport performance is measured by the number of points accumulated at the end of the national league, whereas sport performance in European competitions counts the number of qualifying rounds that the teams went through. Notice that as far as the number of league points is concerned, given that all the leagues have the same number of teams (and games) and they obey to very similar competition rules, there is no essential difference between using this variable in levels or in mean-deviations.

Then, equation (2) is based on the idea that sport achievements are determined by sport talent, as capture by the teams’ annual wage bills. For the sake of simplicity, we constrain here the analysis to domestic sport achievements as dependent variable. Previous papers (Carmichael et al. (2011), among others) have conducted similar empirical analyses as the ones defined in equation (1) and equation (2).

5.1. Estimations of “Wage-to-Revenue Ratio” Models

Section 3 provided evidence on structural changes happening around 2014 that have altered the clubs’ behavior concerning WRR. In this section, this issue is more carefully examined through regression analyses by introducing seasonal dummies in search of significant alterations – across teams of the same league – from the usual WRR figures. We further hypothesize that the fact that WRR changes occurred immediately after the new regulations adopted by UEFA hints that the latter fact may be the cause of the former.

The regression analysis is initially carried out for the pooled OLS model, with robust standard errors. Then, to benefit from the additional information contained in panel data analysis, and to account for the potential influence of individual heterogeneity elements, we also estimate fixed effects (FE) and random effects (RE) models.

Equation (3) describes the specification of these models:

$$WRR_{it} = \beta_0 + \beta_1 \cdot WRR_{it-1} + \sum_{t=1}^5 \vartheta_t \cdot SeasonDummy_t + \sum_{j=1}^3 \gamma_j \cdot LeagueDummy_j + \mu_{it} \quad (3)$$

To elucidate whether the fixed or the random effects model must be preferred, we computed the Hausman (1978) test.¹² In our case, the “chi-square” (with 6 degrees of freedom) is equal to 88.43, with a P-value of 0.0000, implying that the null hypothesis (Ho: difference in coefficients is not systematic) has to be rejected. Given the results of the test, which strongly support the FE model, Table 2 only reports – along with the pooled model – the FE estimated coefficients.

This is aligned with the expected theoretical outcome, as every football club is supposed to have specific characteristics invariant over time. In the regression analysis we include a set of dummy variables to control for distinctive traits of the domestic leagues (with the Italian Serie A taken as the reference).

The results of the pooled model in Table 2 suggest that FFP regulations might have provoked a consistent reduction of football clubs' WRR over time, as the coefficients of the seasonal dummies (with season 2010/11 being the reference value) are negative. This conclusion applies especially to season 2012/13: the size of the coefficient (−4.849) is greater than the ones attached to other seasons; and, more importantly, it is statistically significant. Furthermore, examination of the FE estimations reveals that structural changes on WRR are more significant (in size and statistically) when accounting for individual heterogeneity elements, as Table 2 also discloses.

Table 2. Wage to Revenue Ratios – Pooled OLS and Fixed Effects Models.

	Pooled OLS	P-value	Fixed Effects	P-value
Lag of WRR	0.5483***	[0.000]	0.1744***	[0.002]
Premier League	6.3617***	[0.002]		
Spanish La Liga	3.6584*	[0.088]		
French Ligue 1	9.3253***	[0.000]		
Season 2011/12	−2.2948	[0.438]	−1.6074	[0.499]
Season 2012/13	−4.8494*	[0.091]	−5.3549**	[0.028]
Season 2013/14	−4.3309	[0.138]	−5.0366**	[0.041]
Season 2014/15	−3.7724	[0.178]	−5.5113**	[0.029]
Season 2015/16	−3.6351	[0.176]	−4.8504*	[0.052]
Constant	28.7302***	[0.000]	59.1155***	[0.000]
No. Obs.	407		407	
No. Groups	–		102	
R-squared	0.4242		0.3269	
AIC	3,320.34		3,155.58	
Prob > F	[0.000]		[0.006]	

Statistical significance: * p < 0.1; ** p < 0.05; *** p < 0.01 | and [P-values] in brackets.

¹² The Hausman test is based on the following: if the specification of the model is right, the null hypothesis of no correlation is fulfilled and, therefore, the coefficient estimates of the fixed and random effects models should not statistically differ. Under fulfilment of the null hypothesis, both fixed and random effects estimators are consistent; but the latter model should be chosen since their estimations are more efficient. However, in our case the null hypothesis is rejected and, as the RE estimations are not consistent, the FE model must be chosen.

Table 3. Wage to Revenue Ratios – OLS regressions by Leagues (levels).

	PremierL	P-value	La Liga	P-value	Serie A	P-value	Ligue 1	P-value
Lag of WRR	0.7742***	[0.000]	0.5122***	[0.008]	0.6426***	[0.000]	0.4010***	[0.000]
Season 2011/12	-1.8073	[0.507]	-7.3778	[0.421]	-1.7141	[0.651]	1.2196	[0.801]
Season 2012/13	2.7377	[0.425]	-18.768**	[0.029]	3.6121	[0.268]	-6.8848*	[0.071]
Season 2013/14	-14.6106**	[0.000]	-8.4217	[0.370]	5.4714	[0.118]	-1.1957	[0.777]
Season 2014/15	0.5750	[0.836]	-12.7850	[0.126]	-4.8504	[0.646]	1.9228	[0.426]
Season 2015/16	-0.0115	[0.996]	-16.978**	[0.039]	1.7396	[0.639]	1.3489	[0.740]
Constant	18.6422***	[0.003]	42.4499**	[0.011]	18.4191***	[0.000]	47.0782***	[0.000]
No. Obs.	102		102		101		102	
R-squared	0.6583		0.3737		0.4436		0.2002	
AIC	732.07		916.37		760.13		795.20	
Prob > F	[0.000]		[0.000]		[0.006]		[0.000]	

Statistical significance: * p < 0.1; ** p < 0.05; *** p < 0.01 | and [P-values] in brackets.

Our results suggest the existence of structural change occurring around the year 2013, a finding that could be arguably related to the UEFA FFP restrictions.¹³

We further refine the analysis by replicating the same estimation models by leagues, in search of distinctive patterns associated to each of them. Table 3 gathers the results of the pooled OLS model estimation by leagues. (The same specification models were estimated accounting for FE, but they are they yield similar results, with nearly identical significance levels attached to the coefficients of seasonal dummies, and hence are not shown).

The analysis by leagues allows us distinguishing the time at which the WRR experienced drops in each of the domestic football leagues, except for the Italian Serie A, all the other football leagues display sharp reductions of WRR at once: in France and Spain it happened in 2012/13, whereas the drop affected the Premier League in the following season.

For the case of Spanish football, it is also worth noting the negative and significant coefficient associated with season 2015/16. This fact may perhaps be related to the new law (Real Decreto-ley) to regulate football TV commercial rights that was ruled in Spain on the 30th April 2015. (Cf.: the description offered in the “note 8”).

To summarise the findings until now, this section has provided solid evidence that WRR of European clubs tend to converge towards smaller and more similar figures all across the main football leagues. There are little discrepancies in the timing of this process, which is meant to be a direct consequence of UEFA rules; namely, FFP regulations and break-even requirements.

5.2. Estimation of “Revenue Equation” Models

The “Revenue Equation”, as defined earlier in this section by expression (1), studies the relevance of sport performances to explain football clubs’ capacity to generate revenues. The simple specification of the functional form used in the estimations is described in equation (4):

¹³ These regulations are imposed on clubs that qualified to the UEFA leagues, which must prove to have no overdue debts. Although they were initially approved in 2010, the break-even requirements to balance clubs’ spending and revenues were only introduced in 2013, and the first sanctions to clubs were only effective in season 2014/15.

$$R_{it} = \delta_0 + \delta_1 \cdot DSP_{it} + \delta_2 \cdot CLP_{it} + \delta_3 \cdot EUP_{it} + \sum_{t=1}^6 \vartheta_t \cdot SeasonD_t + \sum_{j=1}^3 \gamma_j \cdot LeagueD_j + \varepsilon_{it} \quad (4)$$

We mentioned earlier that previous research addressed this issue by estimating models like the one in equation (4). Nevertheless, the results of Table 4 are precious for two reasons: first, the estimations are obtained from a very comprehensive data set, which contains 80 teams per season over 7 seasons; secondly, our analyses are useful to check the findings of previous research on the topic (Cf.: Szymanski and Smith, 1997; and Garcia-del-Barrio and Szymanski, 2009). Besides, the results collected in Table 4 are pertinent for the discussion on the clubs' objectives and how their goals may be affected by institutional changes.

Table 4 reports the pooled OLS estimations of three alternative models that differ on the way how the dependent variable was defined. Whereas in model (R1) annual revenues are in levels; estimations of model (R2) are made for natural logarithms of the dependent variable; finally, model (R3) takes the revenues also in logs, but expressed in deviations from the league average.

Our estimations corroborate the main results of previous papers: teams' sport performance appears as a major factor in generating revenues. Furthermore, along with the domestic performances, sport achievements in European competitions are also relevant, especially as far as the UEFA Champions League is concerned. The case of the UEFA Europa league is less evident, given the size of the estimated coefficients, and since the coefficient is not statistically significant in model (R1). Anyway, each of the models describing the revenue equations' behavior has advantages and disadvantages. The first one is convenient as it facilitates interpreting the results; while the 2 other models perform better in terms of the R-squared the "Akaike information criterion" (AIC).

Table 4. Annual Revenue explained by Sport Performance (in both domestic and European leagues).

	Revenues		Log Revenues		Mean Deviat. Log Revenues	
	Model (R1)	P-value	Model (R2)	P-value	Model (R3)	P-value
Domestic Points	2.6948***	[0.000]	0.0220***	[0.000]	0.0221***	[0.000]
UCL Games	32.4765***	[0.000]	0.1801***	[0.000]	0.1781***	[0.000]
EUR Games	1.5394	[0.419]	0.0647***	[0.000]	0.0658***	[0.000]
Premier League	61.3159***	[0.000]	0.4668***	[0.000]	-0.0471	[0.203]
Spanish La Liga	-23.9031***	[0.000]	-0.5796***	[0.000]	-0.1009**	[0.015]
French Ligue 1	-33.1662***	[0.000]	-0.5333***	[0.000]	0.0433	[0.283]
Season 2010/11	1.2078	[0.862]	0.0277	[0.567]	0.0255	[0.579]
Season 2011/12	12.7741*	[0.072]	0.0984*	[0.063]	0.0391	[0.445]
Season 2012/13	17.3383**	[0.019]	0.1348***	[0.008]	0.0400	[0.415]
Season 2013/14	28.9518***	[0.000]	0.1952***	[0.000]	0.0172	[0.734]
Season 2014/15	39.2270***	[0.000]	0.2636***	[0.000]	0.0132	[0.773]
Season 2015/16	52.7217***	[0.000]	0.3574***	[0.000]	0.0229	[0.646]
Constant	-81.2029***	[0.000]	2.9704***	[0.000]	-1.3353***	[0.000]
No. Obs.	557		557		557	
R-squared	0.7710		0.8483		0.8037	
AIC	6079.15		365.299		310.343	
Prob > F	[0.000]		[0.000]		[0.000]	

Statistical significance: * p < 0.1; ** p < 0.05; *** p < 0.01 | and [P-values] in brackets.

5.3. Estimation of “Sport Performance” Models

In this section, we focus on behavioural equations for “Sport Performances” of football clubs, as defined in equation (2). We then present estimation results of several alternative models, whose specifications have important implications for the scope of our paper. In the estimations, we rely on different model specifications, which are made explicit in expression (5).

In all the models, the dependent variable (sport performance) is the number of points amassed in the domestic league. Regarding the principal explanatory variable, annual wages are sometimes measured in levels, but also as deviations from the respective league mean:

$$DSP_{it} = \alpha_0 + \alpha_1 \cdot W_{it} + \alpha_2 \cdot (W - \bar{W})_{it} + \sum_{t=1}^6 \vartheta_t \cdot SeasonD_t + \sum_{j=1}^3 \gamma_j \cdot LeagueD_j + v_{it} \quad (5)$$

Compared to the two initial models, (W1) and (W2), the third (W3) and fourth (W4) models are estimated after computing logarithmic transformations of the wages. The estimations of similar models are made for the sake of robustness, and the fact that the results are shown all together in Table 5 is due to the meaningful conclusions achieved from comparing them.

The results shown in Table 5 have important implications in the discussion on what the clubs’ priorities are (sport success or economic returns) in decision making at hiring talent in sport labor markets. Actually, the annual wage bills of the teams can be interpreted as a proxy of the intensity with which clubs invest in new talent, which is expected to improve the sport achievements while diminishing the clubs’ economic outcomes.

Table 5. Sport Performance in domestic competitions explained by Sport Talent (Annual Wages).

	Model (W1)	P-value	Model (W2)	P-value	Model (W3)	P-value	Model (W4)	P-value
Annual Wages	0.2086***	[0.000]	-0.0108	[0.864]				
deviation Wages			0.2237***	[0.000]				
Log of Wages					18.2155***	[0.000]	-0.5888	[0.901]
deviat. Log Wages							19.0857***	[0.000]
Premier League	-10.1195***	[0.000]	1.0981	[0.727]	-12.6099***	[0.000]	0.9730	[0.781]
Spanish La Liga	2.2318*	[0.073]	0.8961	[0.484]	7.0640***	[0.000]	0.7644	[0.684]
French Ligue 1	2.9668**	[0.020]	-0.4761	[0.767]	5.1370***	[0.000]	-0.4831	[0.792]
Season 2010/11	-0.5973	[0.692]	-0.4562	[0.757]	-0.7480	[0.598]	-0.4539	[0.745]
Season 2011/12	-1.8169	[0.259]	-0.9405	[0.558]	-1.9464	[0.228]	-0.9524	[0.557]
Season 2012/13	-1.5105	[0.363]	-0.4831	[0.772]	-1.3112	[0.409]	-0.5084	[0.748]
Season 2013/14	-1.9940	[0.250]	0.1334	[0.942]	-1.8409	[0.251]	0.0894	[0.957]
Season 2014/15	-4.1499**	[0.013]	-0.2286	[0.911]	-3.3935**	[0.020]	-0.3249	[0.840]
Season 2015/16	-6.0630***	[0.001]	-0.1693	[0.935]	-5.5885***	[0.001]	-0.2927	[0.880]
Constant	41.4768***	[0.000]	52.6828***	[0.000]	-15.8716***	[0.000]	54.3312***	[0.002]
No. Obs.	558		558		558		558	
R-squared	0.5835		0.5961		0.6409		0.6511	
aic	4217.863		4202.758		4135.132		4121.054	
Prob > F	[0.000]		[0.000]		[0.000]		[0.000]	

Statistical significance: * p < 0.1; ** p < 0.05; *** p < 0.01 | and [P-values] in brackets.

Comparing model (W2) against model (W1), as well as (W4) against (W3), one conclusion seems clear: to explain sport success, wage deviations (from the average wage of competitor teams) works much better than absolute values. This result implies that what matters ultimately is the comparative position of a team – regarding investment in sport talent – relative to the other rivals. That is to say, insofar as the presence in the regressions of wages in mean-deviations (either “dev. Wages” or “dev. Log Wages”) make statistical insignificant the impact of the wages in levels (“Annual Wages” or “Log Wages”), it suggests that it is mainly the relative positioning of the competitors clubs what matters to explain the clubs’ behavior concerning the squad quality and sport achievements.

This finding has implications in the area of industrial organization and labor markets. First, it alerts us of presumably an excessive use of resources by over-investing when hiring sports talent (involving not only the transfer fee but also the wage bill agreement). Moreover, as empirical studies prove, most of the clubs behave as win rather than profit maximisers and, hence, have incentives to mismanagement in the form of excessive spending in sport talent. Inasmuch as other clubs engage in incremental bids to hire players, there is a risk that the whole process becomes a wasteful “arms race” among competitors clubs.

This issue is critical as it relates to the side effect of lower competitive balance resulting from the UEFA new regulatory framework. Despite the fact that FFP rules aim at preventing clubs from being trapped into growing debt and at ensuring a fairer competition, we argue in the next section that they may end up, even if unintendedly, increasing the competitive unbalance of the leagues.

6. Prospective Theoretical Developments

In this section, we use a simple theoretical approach to illustrate how the financial stability improvements procured by UEFA may end up creating greater competitive imbalance across European teams. In principle, by inducing greater financial responsibility, the FFP regulations are certainly expected to lower the risk of financial failure of football clubs. However, we illustrate here that the break-even restrictions, even if unintendedly, will deteriorate the sport competitive balance by creating greater disparities among the clubs’ wage bills.

Thus, we next focus on the UEFA regulations that take the form of break-even restrictions.¹⁴ They are the type of rules that are supposed to have made an impact in explaining the decrease of football clubs’ WRR and their dispersion (as captured by standard deviations).

Our theoretical analysis develops upon the following idea: Given the inner nature of sport contests, it is reasonable to expect that weaker teams may be willing, in the short-run at least, to compensate their poorer sport talent by assuming greater financial instability. This is certainly the case of teams facing relegation risk or those wanting to consolidate their sport brand status.

¹⁴ As explained by Vöpel (2011), the break-even requirement implies that the clubs’ spending is not allowed to exceed what UEFA denotes “relevant revenues”, where income from external patrons or agents is not accounted for.

The literature mentions similar arguments, referring mainly to the fact that restrictions imposed on the teams (like prohibiting the use of external resources) will presumably affect more intensively the functioning of weaker teams. More wide-ranging arguments are invoked by Peeters and Szymanski (2014)¹⁵, who refer to the spill-over effects linked to the drop in the cost of reaching a given level of sport talent and achievements.

In summary, along with other papers, we claim here that the break-even restrictions avoid the possibility of deviating from pre-established WRR values, which fall into the interval considered to be free of financial risk. However, these limits hinder the chances that otherwise weaker clubs might have to reduce their wage gap with respect to other competitors; and then, the leagues can no longer compensate the competitive sport inequalities due to financial imbalances.

6.1. A Simple Theoretical Setting

The scope of this paper also relates to the discussion on football clubs' objectives and priorities. The literature recognises a trade-off between two principal objectives of the teams (and clubs' owners): either they behave as winning or as profit maximising organizations. For the sake of simplicity, we offer just an illustrative framework to describe the main aspects. In Section 4, the two main equations (1) and (2) were defined as follows:

$$R_{it} = f(DSP_{it}, CLP_{it}, EUP_{it}) \quad (1)$$

$$DSP_{it} = g(W_{it}) \quad (2)$$

In this section, we describe the simplest conceivable approach by modelling sport performance as a function of wages; and revenues as a function of sport performance. We also assume that there is only one function of sport performance comprising domestic as well as European games. Thus, we simplify matters to the point of expressing revenues depending on wages.¹⁶ Therefore, equation (1) can be re-written as:

$$R_{it} = f(g(W_{it})) = R(W_{it}) \quad (6)$$

Given the role of the WRR in this paper, it is also crucial to be aware of the economic

¹⁵ The following quote from Peeters and Szymanski (2014) describes extensively this point: "Indeed, some have argued that the break-even rule will reduce competitive balance by limiting the opportunity of smaller teams to erode the dominance of the established teams since they will not be able to use outside resources to fund a challenge. Our analysis shows how the impact of the restraint goes beyond those clubs wanting to spend more than their football resources. Given that higher spending tends to generate better sporting performance, restraining the spending of some clubs reduces the cost of winning for all clubs. Thus, there will be spill-over effects to clubs not directly affected by the limit, by lowering the cost of achieving a given level of success. (...) Thus we argue that the vertical restraint introduced by UEFA will produce an anti-competitive outcome which is comparable to the horizontal salary cap agreements which exist in the US, without the latter's pro-competitive balance effects." (p. 357-8). The issue was implicitly treated by Dietl et al. (2009), since their analysis of a salary cap defined as a fixed proportion of the clubs' income is equivalent to the break-even FFP rules imposed by UEFA.

¹⁶ Assuming that revenues depend on wages, this extremely simple framework actually neglects the possibility to take into account the dynamic behaviour of the equations or a more realistic specification with lagged variables.

meaning attached precisely to the inverse of this ratio. Expression (7) offers a simple relationship between relevant ratios: The “revenues over wages ratio” (RWR) measures the economic returns and, hence, is equivalent to profits:

$$\frac{1}{WRR} = \frac{1}{W/R} = \frac{R}{W} = RWR \tag{7}$$

Figure 5 illustrates the main variables involved in our description (wages, revenues, and RWR) expressed in all three cases as a function of wages. In the figure, we also represent the values of the interval (0.44; 3.05) containing the RWR values of actual football clubs, according to the information of our database. Given that RWR is the inverse of WRR, imposing limits on WRR implies forcing teams to give more priority to profit than to winning maximizing objectives.

The graphical characterization made in Figure 5 highlights the value 1.5 (=3/2) of the RWR, which is equivalent to 2/3 of the corresponding WRR; a threshold that represents the imposition implied by the break-even requirements. The figure also displays the location of the outcome of the representative profit maximizing team, whose wage spending level (investment in talent) is far behind the usual behavior of football clubs. At the opposite extreme to the right, we find win maximizing teams, as the greater wages, the more talent accumulation and sport achievements.

Nonetheless, FFP rules in the form of break-even requirements encourage teams, at least those whose wage bill is greater than the pre-established ratio, to converge towards the aforementioned threshold: $WRR=2/3$ or, equivalently, $RWR = 3/2 = 1.5$. This implies that the teams’ choices are now distorted against sport performance maximization, while the restrictions on WRR force them to approach the profit maximizing outcome and, hence, to gain greater financial stability. Football clubs are typically prone to sacrifice economic returns to improve their (short-run) sport achievements, break-even requirements to participate in UEFA competitions do certainly introduce greater economic rationality.

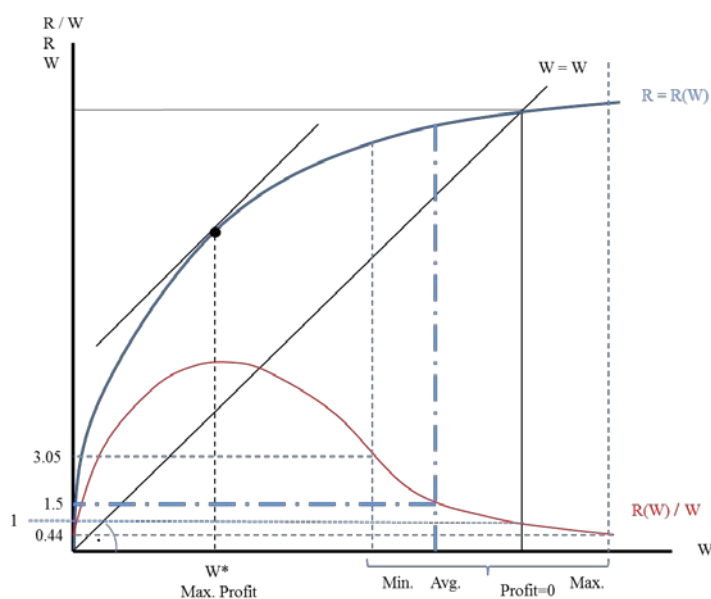


Figure 5. Description of a Simple Illustrative Model.

In this context, the issue of football clubs' objectives could be discussed based on the elaboration made in Equation (8), which may enlighten the discussion on the goals pursued by football clubs. The left-hand side of the equation defines the RWR (similar to clubs' profits) and is split out into two factors, where the second one accounts for sport performance per unit of wage spending.

$$\frac{R}{W} = \frac{R}{SP} \cdot \frac{SP}{W} \quad (8)$$

The analysis of the issue invites exploring the effect of wages on sport performance and the influence of the latter on the revenues, but this new research avenue remains for future research.

6.2. Other Issues and Policy Implications

In economic analysis, the issue of causality is always controversial. In the previous sections, changes in the evolution (and general patterns) of the clubs' WRR have been related to the break-even requirements as if the former were necessarily the consequence of the latter. This fact is difficult to prove empirically, but we propose here a simple example that may help to find out how the causality link operates in this regard.

Consider two rival teams that have initially identical wage bills: $W1 = W2$. The revenues of the first team are equal to its wages, meaning that it currently uses all its annual revenues to pay wages: $W1 = R1$. (This situation is not unusual in the short-run, even if it is incompatible with a sustainable financial situation in the long-run). Instead, the amount of revenues of the second team are actually twice the value of its wages: $W2 = 0.5 \cdot R2$, implying that $R2 = 2 \cdot R1$.

In Table 6, we present one example where the initial allocations are made according to the previous description. Then, the table further describes the effect of introducing break-even requirements implying that $W / R < 2/3$, a threshold that resembles the actual FFP regulations.

Table 6. Impact of regulating the WRR: An illustrative example.

	Team1	Team2	Team1/Team2
Wages	W1	W2	W1/W2
Revenues	R1	R2	R1/R2
W/R	W1/R1	W2/R2	
Initial Allocation			
Wages	3	3	1
Revenues	3	6	1/2
W/R	1	1/2	
Scenario 1			
Wages	2	3	2/3
Revenues	3	6	1/2
W/R	2/3	1/2	
Scenario 2			
Wages	2	4	1/2
Revenues	3	6	1/2
W/R	2/3	2/3	

In the table, Scenario 1 illustrates the case when only Team 1 changes the initial allocations to strictly achieve the rule; hence: $W_1 = 2/3 \cdot R_1$. The wage spending in the case of the second team does already fulfill the restriction and is thus not forced to change its behavior. However, it may be that all the teams end up converging close to the established ratio, in which case, the figures of Scenario 2 would result. Regardless of which scenario is more likely to occur, in both cases sport unbalance between these two rival teams has grown bigger in either case: The wage gap between them (initially zero) ranges now between $2/3$ and $1/2$ of the other team's wage bill.

In summary, by imposing all teams the same WRR, the UEFA restrictions actually enforce the salary gap between two teams to end up being similar to their revenue gap. Only if teams were indifferent to winning maximizing objectives, would FFP rules make no significant impact on their competitive balance or unbalance. But we take for granted that football teams deviate from the economic objectives of other types of enterprises, as the competitive environment among teams involves a zero-sum outcome: one team wins, one loses, or the two rivals draw (Cf.: Peeters and Szymanski, 2014).

Our findings merit more research effort, especially as other authors reach different conclusions. Actually, the aforementioned and very relevant paper by Peeters and Szymanski (2014)¹⁷, the authors argue that, in addition to limit the clubs' spending in payrolls, the UEFA FFP regulations also have the effect of improving the competitive balance of teams, insofar as they moderate the competitive advantage of teams at the top.

7. Conclusions and further research

This paper addresses a number of issues in the context of European football, where the clubs must now fulfill certain rules to get the license to participate in the UEFA competitions. (Cf.: UEFA, 2010). Using a comprehensive dataset of 560 observations (20 teams per league and season over the period: 2009/10 to 2015/16), our empirical analyses accomplish several objectives. First, we corroborate empirical regularities characterizing the football industry: the existence of a strong positive relationship (i) between annual wage spending (in players' talent) and sport performances and (ii) between teams' sporting success and annual revenues.

Second, we find significant empirical evidence that the FFP rules enacted by UEFA are likely to have dropped the football teams' WRR, both the means and their degree of dispersion. This feature was also examined by leagues, to identify which of them have been more sensitive to changes in the FFP. Our empirical analysis also supports that, concerning sport achievements, what matters is the relative – rather than the absolute – quality of the teams (as captured by the clubs' wage bills) with respect to their competitors. Moreover, this feature easily involves excessive spending in hiring talent, which entails a wasteful economic result overall.

Third, we examined the effects that FFP regulations have on the clubs' priorities regarding sport and financial achievements. We actually illustrated – through a simple theoretical

¹⁷ They explore the consequences of the FFP rules, concluding that even if the UEFA regulations do not explicitly impose a limit to the clubs' wage bills, break-even requirements seem ultimately to produce this very effect.

framework – that the FFP rules, designed to procure greater financial stability in European football, have favoured to decline the level competitive balance across clubs. For this reason, our final remark suggests that revenue sharing could be a potential measure to counterbalance the expected loss of competitive balance.

To conclude, further research could explore whether other types of structural breaks may occur in the football industry whenever structural reforms such as FFP or changes in the broadcasting contracts (from individual bargaining to collective agreements) may affect the professional football industry.

References

- Aguiar-Noury, A., and Garcia-del-Barrio, P. (2019). Global Brands in Soccer: Identifying low-risk projects and business opportunities, *Journal of Entrepreneurship and Public Policy*, 8(1), 62–83. <https://doi.org/10.1108/JEPP-03-2019-103>
- Andreff, W. (2012). Sport events, economic impact and regulation. In Michel Desbordes and André Richelieu (Eds.), *Global Sport Marketing: Contemporary Issues and Practice*. (Chapter 5).
- Backman, J. (1968). Is Advertising Wasteful? *Journal of Marketing*, 32(1), 2–8. <https://doi.org/10.1177/002224296803200102>
- Barajas, A., and Rodriguez, P. (2010). Spanish Football Clubs' Finances: Crisis and Player Salaries. *International Journal of Sport Finance*, 5(1), 52–66.
- Caporale, T., and Collier, T.C. (2015). Are We Getting Better or Are They Getting Worse? Draft Position, Strength of Schedule, and Competitive Balance in the National Football League. *Journal of Labor Research*, 36(3), 291–300. <https://doi.org/10.1007/s12122-015-9206-z>
- Carmichael, F., McHale, I., and Thomas, D. (2011). Maintaining market position: team performance, revenue and wage expenditure in the English premier league, *Bulletin of Economic Research*, 63(4), 464–497. <https://doi.org/10.1111/j.1467-8586.2009.00340.x>
- Caro, C. A., and Elder, A. (2017). The relationship between spending and winning in college baseball: Is this the new 'arms race' in college athletics? *International Journal of Sports Science and Coaching*, 12(3), 381–397. <https://doi.org/10.1177/1747954117710504>
- Coates, D., and Humphreys, B. R. (2012). Game attendance and outcome uncertainty in the National Hockey League. *Journal of Sports Economics*, 13(4), 364–377. <https://doi.org/10.1177/1527002512450260>
- Deloitte ARFF (2000-2019). Annual Review of Football Finance. Deloitte's Sports Business Group. <https://www2.deloitte.com/uk/en/pages/sports-business-group/articles/annual-review-of-football-finance.html>
- Deloitte DFML (1997-2019). Football Money League. Deloitte's Sports Business Group. <https://www2.deloitte.com/uk/en/pages/sports-business-group/articles/deloitte-football-money-league.html>
- Dietl, H., Franck, E., and Lang, M. (2008). Overinvestment in team sports leagues: A contest theory model, *Scottish Journal of Political Economy*, 55, 353–368. <https://doi.org/10.1111/j.1467-9485.2008.00457.x>
- Dietl, H. M., Lang, M., and Rathke, A. (2009). The effect of salary caps in professional team sports on social welfare', *The B.E. Journal of Economic Analysis and Policy*, 9(1), 129–151. <https://doi.org/10.2202/1935-1682.2034>
- Dietl, H. M., Grossmann, M., and Lang, M. (2011). Competitive Balance and Revenue Sharing in Sports Leagues With Utility-Maximizing Teams. *Journal of Sports Economics*, 12(3), 284–308. <https://doi.org/10.1177/1527002511404787>

- Edwards, H. (1984). The collegiate athletic arms race: Origins and implications of the “Rule 48” controversy. *Journal of Sport and Social Issues*, 8(1), 4–22. <https://doi.org/10.1177/019372358400800103>
- Forrest, D., and Simmons, R. (2002). Team salaries and playing success in sports: a comparative perspective. *Zeitschrift für Betriebswirtschaft*, 72(4), 221–238. https://doi.org/10.1007/978-3-663-07711-4_12
- Franck, E. (2014). Financial Fair Play in European Club Football - What is it All About? University of Zurich, Department of Business Administration, *UZH Business Working Paper* No. 328. <https://doi.org/10.2139/ssrn.2284615>
- Gallagher, R., and Quinn, B. (2019). Regulatory own goals: the unintended consequences of economic regulation in professional football. *European Sport Management Quarterly*. Online: 3 April 2019. <https://doi.org/10.1080/16184742.2019.1588344>
- García, J., and Rodríguez, P. (2002). The determinants of football match attendance revisited: Empirical evidence from the Spanish football league. *Journal of Sports Economics*, 3(1), 18–38. <https://doi.org/10.1177/152700250200300103>
- García-del-Barrio, P. (2018). Media Value in Global Sports: Football versus Formula One, *International Journal of Sport Management and Marketing*, 18(3), 241–266. <https://doi.org/10.1504/IJSM.2018.10012851>
- García-del-Barrio, P. and Pujol, F. (2020). Recruiting talent in a global sports market: Appraisals of soccer players’ transfer fees. *Managerial Finance*, Forthcoming. <https://doi.org/10.1108/MF-04-2020-0213>
- García-del-Barrio, P., and Szymanski, S. (2009). Goal! Profit maximization and win maximization in football leagues, *Review of Industrial Organization*, 34(1): 45–68. <https://doi.org/10.1007/s11151-009-9203-6>
- García-del-Barrio, P., and Tena-Horrillo, J. D. (2019). Investment in Talent and Visibility in the Media: A Study of Professional Football in Europe. In Jaume García (Ed.), *Sports (and) Economics* (pp. 271–294). FUNCAS Social and Economic Studies, 7. Madrid, Spain.
- Ghio, A.; Ruberti, M., and Verona, R. (2019). Financial constraints on sport organizations' cost efficiency: the impact of financial fair play on Italian soccer clubs. *Applied Economics*, 51(24), 2623–2638. <https://doi.org/10.1080/00036846.2018.1558348>
- Hausman, J. (1978). Specification Tests in Econometrics. *Econometrica*, 46, 1251–1271. <https://doi.org/10.2307/1913827>
- Heiskanen, A. (2017). UEFA Financial Fair Play’s effect on the salary-to-revenue ratios of European professional football clubs – evidence from top-5 football leagues in Europe. <https://aaltodoc.aalto.fi/handle/123456789/26796>
- Hoffer, A., Humphreys, B. R., Lacombe, D. J., and Ruseski, J. E. (2015). Trends in NCAA Athletic Spending: Arms Race or Rising Tide? *Journal of Sports Economics*, 16(6), 576–596. <https://doi.org/10.1177/1527002515592541>
- Lazear, E.P., and Rosen, S. (1981). Rank-Order Tournaments as Optimum Labor Contracts. *Journal of Political Economy*, 89(5), 841–864. <https://doi.org/10.1086/261010>
- Litan R., Orszag J. and Orszag P. (2003). *The empirical effects of collegiate athletics: An interim report*. (Commissioned by the National Collegiate Athletic Association). Retrieved from: https://www.ncaa.org/sites/default/files/empirical_effects_of_collegiate_athletics_interim_report.pdf
- Madden, P. (2015). Welfare Economics of “Financial Fair Play” in a Sports League With Benefactor Owners. *Journal of Sports Economics*, 16(2), 159–184. <https://doi.org/10.1177/1527002512465759>
- Neale, P. (1964). The peculiar economics of professional sports: a contribution to the theory of the firm in sporting competition and in market competition. *Quarterly Journal of Economics*, 78(1), 1–14. <https://doi.org/10.2307/1880543>
- Orszag, J. M., and Orszag, P. R. (2005). *The Physical Capital Stock Used in Collegiate Athletics*. Indianapolis, IN: National Collegiate Athletic Association.
- Orszag, J. M., and Israel, M. (2009). *The Empirical Effects of Collegiate Athletics: An Update Based on 2004-2007 Data*. Indianapolis, IN: National Collegiate Athletic Association.

- Owen, D. (2014). Measurement of competitive balance and uncertainty of outcome. Chapter 3 in: *Handbook on the Economics of Professional Football* (Ed.: Goddard, J.; Sloane, P. J.). Edward Elgar. Cheltenham, UK - Norhampton, MA, USA.
- Pawlowski, T., and Anders, C. (2012). Stadium attendance in German professional football—The (un)importance of uncertainty of outcome reconsidered. *Applied Economic Letters*, 19, 1553–56. <https://doi.org/10.1080/13504851.2011.639725>
- Peeters, T., and Szymanski, S. (2014). Financial fair play in European football. *Economic Policy*, 29(78), 343–390. <https://doi.org/10.1111/1468-0327.12031>
- Rohde, M., and Breuer, C. (2016). Europe's Elite Football: Financial growth, sporting success, transfer investment, and private majority investors. *International Journal of Financial Studies*, 4(2), 12. <https://doi.org/10.3390/ijfs4020012>
- Rottenberg, S. (1956). The baseball players labor market. *Journal of Political Economy*, 64(3), 242–58. <https://doi.org/10.1086/257790>
- Sanderson, A. R. (2002). The Many Dimensions of Competitive Balance. *Journal of Sports Economics*, 3(2), 204–228. <https://doi.org/10.1177/152700250200300206>
- Szymanski, S., and Smith, R. (1997). The English football industry: profit, performance and industrial structure. *International Review of Applied Economics*, 11(1), 135–153. <https://doi.org/10.1080/02692179700000008>
- Szymanski, S. (2006). The future of football in Europe. In Placido Rodriguez, Stefan Kesenne, and Jaume Garcia (Eds.), *Sports Economics After Fifty Years: Essays in Honour of Simon Rottenberg*, Oviedo, Spain: University of Oviedo.
- Torgler, B., and Schmidt, S. L. (2007). What shapes player performance in soccer? Empirical findings from a panel analysis. *Applied Economics*, 39(18), 2355–2369. <https://doi.org/10.1080/00036840600660739>
- Tsitsos, W., and Nixon II, H.L. (2012). The Star Wars Arms Race in College Athletics: Coaches' Pay and Athletic Program Status. *Journal of Sport and Social Issues*, 36(1), 68–88. <https://doi.org/10.1177/0193723511433867>
- Tullock, G. (1980). Efficient rent-seeking; In J.M. Buchanan, R.D. Tollison and G. Tullock (Eds.): *Toward a theory of rent-seeking society*. College Station: Texas A.andM. University Press.
- UEFA (2010). *UEFA Club Licensing and Financial Fair Play Regulations*, Lyon.
- Vöpel, H. (2011). Do we really need financial fair play in European Club Football? An Economic Analysis, *CESifo DICE Report*.

Annex

