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# Objectives pursued by European football clubs: Compete for income through victories and media exposure

## Structured Abstract

**Design/methodology/approach:** This paper applies SEM (path analysis) techniques to re-examine what is the more realistic description of football club owners' decisions when hiring talent. Our database comprises teams from the first division of four top European football leagues: 80 observations per season during the pre-Covid period spanning from 2009/10 to 2017/18.

**Purpose:** The paper revisits the debate on the priorities of football clubs in talent hiring with respect to maximizing sporting performance or economic profitability. Based on the degree of media exposure of the clubs, we examine whether the clubs' objectives include, in addition to the classic twofold choice, the aspiration of club managers to gain popularity through media exposure.

**Findings:** The results suggest that, when recruiting players, in addition to considering the two classic objectives (wins and profits), club owners also seem to aim expanding the media exposure and popularity of their clubs. Our study reveals that, to explain talent hiring decisions in football, the ability to attract media attention is as crucial as sporting performance could be. Furthermore, by examining the direct, indirect and total effects on annual revenue, we found that our media visibility index performs a mediation effect connecting sports performance and revenue.

**Originality/value:** An innovative feature of our analysis is the use of the MERIT media visibility index, which jointly captures the on-field and off-field players' skills. The consistency and robustness of the results derive from the various specifications of the estimated models.

## Abstract

This paper revisits the debate on football clubs' priorities regarding maximising sporting performance (league points) or economic profitability (annual revenue). Based on clubs' involvement in media exposure, we re-examine to what extent clubs also aim to maximize media visibility. The empirical analysis is carried out on data from teams competing in the first division of four of the Big-5 European football leagues, comprising 80 teams in the pre-Covid period spanning from 2009/10 to 2017/18. The paper concludes that the objectives of the clubs go beyond the classic twofold choice, as owners often try to gain greater media visibility and popularity.

*Keywords:* European football; club objectives; media visibility; sport performance; wages and revenue; structural equation modelling.

*JEL-Classification codes:* D22; J24, J33.

## Objectives pursued by European football clubs: Compete for income through victories and media exposure

### 1. Introduction

Professional sports are a noteworthy part of the entertainment industry. The business of football, as part of the modern sports business, is built upon sport talent and depends on the capacity of individuals and teams to generate revenue through their media exposure and popularity. Therefore, both the *on-field* and *off-field* skills of players must be considered major assets that work as driven factors in developing sport brands.

Football players are skilled workers who display their exclusive talents in the playing field. Some individuals possess, along with sport talent, other skills that make them popular.

The literature on **the labour market in professional sports** initially assumed that players' contribution to their teams consisted basically of their sporting performance and attainments (Scully (1974); Berri (1999); and Horowitz and Zappe (1998), among others)<sup>1</sup>.

In the context of revenue generation and profit maximization of **sports teams**, some papers examine the existence of a wage premium **associated with** specific sporting skills (for instance, Ehrlich & Potter, J.M. (2021), and Potter & Ehrlich (2022) examine if a premium reward is typically attached to offensive skills in sport competitions). In **this** paper, **we** focus on the *off-field* talent of players, which may also merit additional remuneration. Previous researcher (Korzynski and Paniagua (2016); Garcia-del-Barrio and Pujol (2021); Aguiar-Noury et al. (2022)) argues that the players' ability to draw the attention from the fans and the media is a crucial factor to generate spectacle and, hence, to explain the clubs' spending in talent and their revenue generation capacity.<sup>2</sup> Prinz and Thiem (2021)

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<sup>1</sup> Moreover, Horowitz and Zappe (1998) explicitly recognize that: "*it is generally acknowledged in the literature that player's economic rewards are based on sporting performance*". Franck and Nüesch (2012) introduced the distinction between on-field and off-field related news articles. Frick (2007) argue that the new available information on football players contracts (including salaries and transfers fees) facilitates embracing novel avenues of research concerning this peculiar labour market. Previous research studied the relationship between sport performance and economic outcomes derived from good managerial practices, such as the UEFA financial fair play. While some papers (Di Simone & Zanardi, 2021) find no significant effect of the UEFA fair play regulations on sport and financial results, other papers (Garcia-del-Barrio & Agnese, 2022) suggest that respectable financial and managerial practices lead to better sport performance, and more chances to qualify for UEFA competitions.

<sup>2</sup> Consumers of sporting events use social networks that add to, rather than replace, other traditional information channels. Chang et al. (2016) develop a profit maximization framework where sport teams establish the prices of home matches considering not only the current revenue but also the deferred (strategic) revenue.

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3 adopt a long run approach, claiming that football players' talent is not only a productive input, but  
4 also an asset for clubs that behave as value-maximizing entities. Buraimo et al. (2015) also focus on  
5 the long run, providing evidence that longer contracts come along with better sport performance of  
6 the players; a finding that should be considered in the clubs' contract management.  
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10 Football clubs are often in financial difficulties, despite the revenue growth exhibited by the main  
11 European football leagues (Szymanski, 2017). **This feature, particularly evident up until Covid-19,**  
12 **has continued afterwards, with many clubs facing recurring deficits on their balance sheets.**  
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15 This paper revisits the **debate** on club objectives and priorities. **It** examines whether **club** owners try  
16 to maximise economic returns (annual revenue and profits) or **sporting** performance when deciding  
17 **on** the signing and wage of a player. Some papers hold that football clubs generally behave as win  
18 rather than as profit maximising agents: Sloane (1971); Késenne (1996); Zimbalist (2003); Késenne  
19 (2006); Vrooman (2007); Garcia-del-Barrio and Szymanski (2009); Fort (2015). Other studies  
20 support instead that clubs tend to maximise profits: El-Hodiri and Quirk (1971); Fort and Quirk  
21 (1995); Szymanski and Késenne (2004); Grossmann and Dietl (2009). The literature recognises the  
22 existence of a trade-off between wins and profits (Dietl et al., 2008), which leads **to** assuming that  
23 sports leagues are contest where clubs behave as "utility" maximisers of a weighted sum of wins and  
24 profits (Dietl et al., 2011), which presumably **comes** closer to a realistic approach **to** this issue.  
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32 However, some researchers believe that **no** definitive conclusions **can be drawn from this debate**. On  
33 one hand, Fort and Quirk (2004) argue that comparisons between profit and win maximizing choices  
34 cannot be made without information **about** clubs' revenue functions. On the other hand, Zimbalist  
35 (2003) stresses the difficulty **of** distinguishing profit maximizing from other behaviours **on the basis**  
36 **of empirical analysis** and, hence, suggests that club owners **may be seeking to** maximize long-term  
37 economic returns.  
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42 In developing a business, there are certain particularities affecting the industry. For instance, the act  
43 of cooperate between competing firms, labelled as "coopetition" in the literature, is a phenomenon  
44 that often involves complex interactions between competition and cooperation (Klimas and Czakon  
45 (2018); or Wang and Chen (2022), for instance). This type of collaboration, however, is  
46 commonplace in the industry of team sport leagues (Neale, 1964), where rivals compete in the  
47 playing field while they typically need to cooperate in order to deliver entertainment events of greater  
48 quality and to maximize economic profitability. **More recent studies examined the issue of**  
49 **"coopetition" – competition between rivals who need to cooperate – in relation to the strategic**  
50 **choices of football clubs (Feuillet et al., 2020).**  
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57 There are other distinctive characteristics prevalent in the sports industry. On one hand, fans of sport  
58 events are typically more engaged and loyal than consumers of other products, as Baker et al. (2016)  
59 argue. On the other hand, Chiu & Won (2022) show that the ethnical origin of fans influences their  
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3 media consumption, while Fenton et al. (2023) find the interactions through social media useful to  
4 develop a sense of community amongst football club's supporters.  
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7 In this paper we carry out an empirical study on a rich data set to investigate if club owners, rather  
8 than facing a twofold choice, may be considering a third conceivable objective: maximising the  
9 visibility in the media and popularity of the club. In this paper we explore theoretical interactions  
10 between various alternative objectives that the clubs' owners may pursue when making hiring  
11 decisions through *Structural Equation Modelling* (SEM) techniques<sup>3</sup>. Among other advantages  
12 explained later, the SEM approach permits conducting a proper mediational analysis due to its  
13 capacity to conduct simultaneous estimation; a feature that is crucial for the objective of this paper.  
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18 In the context of management, SEM models (Shook et al. 2004) have proved to be useful to study  
19 relationships between the market orientation strategies of firms and the customers and personnel  
20 attitudes. The SEM approach has been applied to sport brands. For instance, Byon et al. (2010) study  
21 the consumption patterns in professional team sports by assessing several market demand factors.  
22 They adopt a five-steps procedure whose predictive validity is examined by conducting a SEM  
23 analysis. The paper by Toder-Alon et al. (2019) studies professional basketball and applies SEM  
24 analysis to test the moderating role of ageing concerning the relationship between team identification  
25 and fan aggression. Other examples include: Katz et al. (2018), who examine through SEM  
26 techniques fan-to-fan and fan-to-team relationships to explain attendances (in intercollegiate sport  
27 leagues); Lee et al. (2016), where SEM approach is used to investigate the consumers' social  
28 motivations and how they relate to fan loyalty in the Chinese Professional Baseball League; or Novak  
29 et al. (2021), who apply these techniques to Australian Super Rugby for examining the effects of key  
30 performance indicators on team match outcomes. Then, Kim et al. (2022) whether symbiosis or  
31 competition prevails in the relationship between sport media consumption and event attendance in  
32 sports; while Zapata & Martínez-Caro (2022) find a mediating effect between fit event-sponsor and  
33 sponsor image in the consumer's exposure to the Olympic Games of Rio.  
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44 The rest of the paper is organised as follows. Section 2 provides a brief report about the economic  
45 situation of the football industry. Then, Section 3 describes the data sources and the main variables.  
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49 <sup>3</sup> Defining a SEM model implies assuming a theoretical framework with underlying links between observable  
50 variables – *Path Analysis* – or between observable and latent variables (Gúardia-Olmos, 2016). *Path Analysis*  
51 (PA) is thus a particular case of SEM, with only observed variables. The PA, initiated by Wright (1921, 1934,  
52 1960), acquired popularity in 1960, when it started to be applied to social sciences. Econometricians (Li, 1975)  
53 based on Wright's work, introduced tight conditions to meet the requirements for a correct formulation and  
54 estimation of SEM models. Then, inspired by earlier works of biometricians and econometricians, Blalock  
55 (1971) applied the simplicity of PA to the field of sociology. Duncan (1975) provided us with a reference book  
56 on PA and SEM. For a description of the beginnings of SEM and its main applications, see Tarka (2018).  
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In Section 4, which is the core part of the paper, we estimate several theoretical models and discuss the results. Finally, the final section summarizes the results and conclusions.

## 2. Economic context of the Football industry

Recently, we have witnessed an increasing prevalence of European football within the entertainment industry. The 2018/19 season (before the impact of the Covid-19 pandemic) witnessed football reaching record levels of revenue generation. According to Deloitte (Annual Review of Football Finance, 2020) the total revenue of European football in 2018/19 totalled €28.9 billion, a 2% increase with respect to season 2017/18.

The European market share of professional Football is largely dominated by the Big-5 domestic leagues: England, Spain, Italy, Germany and France, whose cumulative revenue accounted for €17.0 billion in season 2018/19, which means 59% of the European football total. The growing revenue of football teams and leagues has called attention of the researchers. Table 1 reports data on total annual revenue of the Big-Five domestic football leagues, as well as of the UEFA Champions League.

[Insert Table 1 here]

A surprising feature characterising this industry is that, despite the large revenue obtained by the main football leagues, the clubs seldom get generate profits. The data allows us identifying the leagues and periods in which the expansion was faster.

To facilitate the analysis of the evolution of annual revenues, Table 2 computes average growth rates for 5-year periods by leagues. Although the choice of 5-years periods is an arbitrary choice, it allows for comparison of disparities in growth trends between leagues.

[Insert Table 2 here]

Concerning the financial perspectives of the football market, notice first the astonishing revenue growth of football leagues over the considered years. Second, even if the figures are positive, the analysis by periods reveals a negative impact of the economic recession: the growth rate slows down along with the business cycle. Third, regardless of the observed disparity across periods and leagues, the Big-5 domestic football competitions multiplied by about 3.5 their combined revenue over the 18-years period (from season 2000/01 to 2018/19). Forth, annual revenue data reveals that the Premier League leads the growth rate over the period, while the UEFA Champions League appears to be experiencing a process of convergence, as its annual revenue now exceeds that of other leagues.

## 3. Description of the Main Variables and Data Sources

The empirical analysis is developed on models involving financial variables (annual revenue, annual wage bills and annual profits) along with sport performance (league points) and performance in terms of media visibility and popularity (the MERIT index).

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3 The data comprises clubs in the first division leagues of four of the “Big-5” domestic competitions  
4 in Europe: England, Spain, Italy and France. The analysis is carried out upon a sample of 720  
5 observations: 20 teams in the top division leagues times the 4 mentioned leagues times the 9 seasons  
6 running from 2009/10 to 2017/18.<sup>4</sup> Table 3 reports the descriptive statistics, by season and domestic  
7 league, of the main variables. In addition to that, Figure 7 (in Appendix 1) shows four Kernel density  
8 plots to illustrate discrepancies between domestic leagues for each of the main variables (in  
9 logarithms) that will be introduced in the empirical analysis.  
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14 It should be noted that we used two different sources of financial data. On the one hand, aggregate  
15 annual revenue figures for each domestic league were obtained from Deloitte. On the other hand,  
16 team-level data were obtained from a variety of sources such as: Deloitte Football Money League  
17 (1997-2019); Deloitte Annual Report of Football Finance (2005-2020); and club accounts and data  
18 bases, including Sabi, Aida, Amadeus and Hoovers Data. Nonetheless, these minor discrepancies do  
19 not affect the empirical analysis, which is based on team-level data. Unfortunately, information on  
20 revenue and wages for the Bundesliga was not available.  
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26 [Insert Table 3 here]  
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28 Data on sport performance in the domestic leagues (measured through the total number of points  
29 accumulated at the end of each season) was obtained from the official web pages of the leagues and  
30 from [www.transfermarkt.de](http://www.transfermarkt.de).  
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33 The index capturing the degree of exposure that clubs achieve in the media is one of the main  
34 variables of our empirical study. The procedure to calculate the index of the teams’ exposure (media  
35 visibility) is based on the MERIT approach (*Methodology for the evaluation and rating of intangible*  
36 *talent*). This methodology has been applied to jointly capture sport achievements along with other  
37 characteristics of players and teams, and to measure their capacity to generate economic profits.<sup>5</sup>  
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40 This approach consists of computing media ratings based on the degree of media exposure. We count  
41 the number of news articles associated to each player at a given time period, and use them to evaluate  
42 the players’ sporting skills jointly with their personal off-field attractiveness. This is because their  
43 degree of exposure in the media is meant to stem from sport performance, but it derives also from  
44 the recognition of their social skills.  
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53 <sup>4</sup> The empirical analysis applies to the pre Covid-19 situation: the 2019/20 season will be remembered as the  
54 time when sporting events, along with other activities and public gatherings, were restricted or canceled around  
55 the world to fight the spread of pandemic disease, as stressed by Navarro-Picado et al. (2023).  
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58 <sup>5</sup> See Garcia-del-Barrio (2018); and Garcia-del-Barrio and Pujol (2021). A more detailed description of the  
59 methodology can be found at: [www.meritsocialvalue.com](http://www.meritsocialvalue.com).  
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3 The index of media visibility is expressed with respect to the average of the top 2,500 players (from  
4 a data set of more than 5,000 individuals). Thus, the individual score is the factor by which the value  
5 of a particular player multiplies the number of news articles of the representative (average) player in  
6 our sample. Then, the media visibility of a football club is derived by grouping the fifteen individuals  
7 with the greatest media exposure in the team roster. Similarly, by adding up individual media ratings,  
8 we obtain aggregate figures to appraise the comparative status of the domestic leagues.  
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#### 13 **4. Model and Results**

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15 **P**revious studies provided evidence of the positive empirical relationship between the football clubs'  
16 spending in talent – captured by annual wages – and sport achievements (Szymanski and Smith  
17 (1997), Szymanski and Kuypers (2000); Forrest and Simmons (2002); Gerrard (2006), and Barajas  
18 and Rodriguez (2010), among others). **Then**, other researchers (Szymanski and Smith (1997); Berri  
19 (1999); Szymanski and Kuypers (2000)) report evidence of the empirical link between sport  
20 performance and clubs' annual revenue.<sup>6</sup>  
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26 Nonetheless, in this paper we advocate that the relationship between talent reward (annual wages)  
27 and sport performance, as well as between sport achievements and annual revenue, must be re-  
28 examined taking into account the status of football clubs in terms of media visibility. The **capacity**  
29 **that the skills of** individuals have to attract media attention was **highlighted** in the context of football  
30 clubs' hiring decisions (Garcia-del-Barrio and Pujol, 2007). We hypothesize that clubs aim to achieve  
31 not just sporting attainments and titles, but also increasing media exposure, as a way to attract more  
32 fans and secure greater revenue (and profit) in the long-run. **This is a promising approach, given that**  
33 **the sale of media rights is a major revenue source of professional sporting clubs; therefore, expanding**  
34 **media exposure may be a good strategy to maximise profits.**  
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40 Hence, we claim that the debate on whether football clubs try to maximize sport outcomes or  
41 economic profits needs to be extended to account for a third objective: increasing the visibility in the  
42 media, a goal that interacts with the two traditional goals.  
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45 For the empirical analysis, we follow the usual procedure of expressing the variables in percentage  
46 (share that each team represents relative to its league and season), as well as taking logarithmic  
47 transformations (Garcia-del-Barrio and Szymanski (2009); Carmichael (2011), among others). For  
48 example, the annual wage ( $AW_{it}$ ) would be the logarithm of the annual wage spending – percentage  
49 share – of the  $i^{\text{th}}$  club, relative to the average of the total league spending in period  $t$ ). **Hence, there**  
50 **should be no concern, as these procedures are conventional and extensively used in the literature.**  
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56 <sup>6</sup> Sport economists generally agree that sporting success is a main factor to explain financial success of clubs,  
57 but others stress the role of brand investments (Gladden and Milne (1999); Pawlowski and Anders (2012);  
58 Rohde and Breuer (2017)) and brand heritage (Rose et al., 2021).  
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Our empirical strategy consists of applying a multivariate statistical analysis approach (SEM) and path analysis to test the findings of earlier works and to further analyse the role of media visibility.

#### 4.1. Path Coefficients of the Initial Models

The SEM technique seems to be, as analytical tool, ideal to simultaneously test complex relationships among variables, along with multiple mediator effects (Peugh and Feldon, 2020). Testing and interpreting how well structural equation models fit sample data has been a methodological challenge for many years.<sup>7</sup>

This section explores – through SEM approach – the relationships among alternative objectives of club owners at hiring talent. We first estimate a model involving annual revenue and salaries of clubs competing in the first division leagues of four of the “Big-5” domestic leagues in Europe: England, Spain, Italy and France. Our empirical approach permits verifying the relationship between the clubs’ revenue and salaries altogether, in the way Figure 1 illustrates (along with the traditional links between: (i) sport talent and sport attainments; and (ii) sport performance and potential revenue).

Figure 1 describes the initial structural Model (1), which establishes links among annual wages, sport performances (measured through league points in the domestic competition) and annual revenue.<sup>8</sup> The prescribed statistics for Model (1), displayed in Table 4, reveal that we face a saturated model. If the chi-square approaches the degrees of freedom (*d.f.*), it implies that the root mean squared error of approximation (RMSEA) equals zero. Moreover, in addition to RMSEA = 0, when the chi-square test is non-significant (or close to), then the comparative fit index (CFI) equals one (CFI = 1). That is to say,  $(\chi^2/d.f.) = 0$  implies that the model is saturated and hence perfectly fits the data. Some authors claim this is unrealistic, as there are not perfect models in real world...

Based on the results of the initial model (Figure 1), there appears to be a strong link between the quality of a team (measured by annual wages) and its economic profitability (captured by annual revenue); a relationship that would occur through sporting performance (league points).

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<sup>7</sup> Inferential tests of model fit (e.g., chi-square) are biased due to sample size, and descriptive fit indices (e.g., comparative fit index [CFI] and root-mean-square error of approximation [RMSEA]) have no absolute cut-points to reliably differentiate “acceptable” from “unacceptable” fit (Hu and Bentler, 1999). We replicate all the estimations using the average of the variables, computed for the period in which teams were playing in the first division category. These results may be provided upon request, and yield essentially the same conclusions than the ones presented here, although in some cases have poorer statistical properties.

<sup>8</sup> We take into account that, in professional sports, the teams’ wage bill does actually depend on revenue (Cf.: Brown and Jepsen (2009), who study the American Major League Baseball). Peeters (2012) discusses the diverse implications of media revenue sharing based on the team’ sport performances on American and European team-sport leagues.

[Insert Figure 1 here]

Therefore, we try another more comprehensive model, by including the clubs' annual profits, which should be consider the actual target (rather than the revenue) if the aim is to maximise the economic returns. Figure 2 illustrates this alternative model where profits are incorporated to the SEM analysis. The model fits well the data, as indicated by the  $\chi^2$  with one degree of freedom ( $\chi^2/d.f.(1) = 0.01$ ). Besides, the RMSEA and the standardized root mean squared residual (SRMR) are virtually zero, which supports the validity of the model. Finally, the CFI and the Tucker-Lewis index (TLI) are close to 1. Table 4 reports also the path coefficients of the relationships illustrated in Figure 1.

[Insert Figure 2 here]

Concerning the reliability and statistical properties of the estimated model, we rely again on the usual statistics. Concerning RMSEA, researchers typically suggest the value 0.8 as the cut-off for poor fitting models (MacCallum et al., 1996).<sup>9</sup> Besides, the SRMR is also relevant, as it provides us with an absolute measure of fit (defined by the standardized difference between the observed and predicted correlation), in which a perfect fit corresponds to a zero value. According to Hu and Bentler (1999), obtaining a value below 0.08 in the SRMR is generally considered a good fit.

[Insert Table 4 here]

We find that all the estimated coefficients are statistically significant, which indicates that the hypothesized links work well. The results of Model (2), **which postulates the relationships between variables shown in Figure 2**, are more reliable and **have** better statistical properties than Model (1).<sup>10</sup> Hence, the next steps will be developed on Model (2), but after we incorporate the clubs' media visibility status.

The results obtained so far allow us to corroborate the usual links between (i) sport talent (annual wages) and sport performance (league points), and between (ii) league points and annual revenue, while incorporating the complex interactions that there **may** exist among the different relevant variables.

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<sup>9</sup> For instance, MacCallum et al. (1996) hold that RMSEA of 0.01, 0.05, and 0.08, indicates an excellent, good, and mediocre fit, respectively. Ideally, the lower value of the 90% confidence interval for RMSEA must be smaller than 0.05 and the upper value smaller than 0.08.

<sup>10</sup> The fact that RMSEA is equal to zero, and CFI to one, in Model (1) do not imply that they must be disqualified as criteria to evaluate the model fit, since this occur often in perfectly specified models, if the degrees of freedom (which, in path analysis, do not relate to the sample size, but are computed as the number of parameters in the estimated model minus the parameters of the baseline model) are greater than the chi-square statistic. In front of saturated models, the chi-square will be zero (with zero degrees of freedom), because there cannot be an estimated model performing better than the saturated model.

#### 4.2. Path Coefficients and Mediation Analysis of the Models with Media Visibility

In this section, we add to the analysis a variable that measures the media visibility of clubs. In fact, we rely on the MERIT approach to calculate media visibility appraisals. Figure 3 shows the main linkages of our theoretical model, which hypothesises that media visibility may be a target itself, which is compatible with its role as a mediator element towards increasing the clubs' revenue too.

We thus propose two extended models involving the Media Visibility variable, which introduces potential mediation effects. As Figure 3 illustrates, in the case of Model (3) in Table 5, Media Visibility may mediate in the relationship of League Points and Annual Revenue.

[Insert Figure 3 here]

The results yield an important conclusion: the usual empirical links – between (i) sport talent (annual wages) and sport performance (league points), and between (ii) league points and annual revenue – must be recognised without neglecting the role of the clubs' media visibility status. Both Model (3) and Model (4) in Table 5 fit reasonably well the data. Moreover, they both have good overall fit, as indicated by the CFI index, and the small residuals (i.e., RMSEA). Anyway, it is also clear that Model (4) overperforms Model (3), which suggests that there is a direct link between Annual Wages and Media Visibility. It means that representation shown in Figure 5 is presumably going to be the preferred model.

Besides, as revealed in Table 5, once the model incorporates the media visibility variable, another mediation effect may arise, as league points could presumably mediate in the link between annual wages and media visibility. Hence, the more comprehensive Model (4) includes two mediation effects at the same time: the already mentioned mediation of media visibility, and also the mediation involving the league points.

[Insert Table 5 here]

According to our declared objectives, when proceeding to estimate the whole theoretical model as described in the figures, it is desirable to verify the existence of a mediator role of some principal variables. Actually, the inclusion of the media visibility status among the clubs' objectives, requires performing mediation analysis to explore statistically significant interrelations within the model.

Specifically, to assess the mediator effects, we apply a path analysis model to examine multiple inter-relationships between the relevant variables, and to investigate if the media visibility variable fulfils a mediation role. We follow the methodological description made in Bernardo et al. (2012) and Zhao et al. (2010). According to the latter paper, the most appropriate and acceptable solution to test the indirect effect is by applying the Preacher and Hayes (2004) bootstrapping test. Moreover, the latter paper recommends using SEM for assessing mediation since it permits controlling for measurement

error while it provides also a way for exploring potential mediation effects.<sup>11</sup> Of course, the estimators relating League Points and Annual Revenue in Model (2), with value 0.51 (as shown in Figure 2), must be equal to the sum of the direct effect between the two variables, which is 0.21 (Figure 3) plus the indirect effect through Media Visibility ( $0.30 = 0.54 \cdot 0.56$ ); and indeed, it holds that:  $0.51 = 0.21 \cdot 0.30$ . Table 6 reports the results of estimating the model, where the direct, indirect and total mediation are disentangled. The table reports the unstandardized coefficients ( $b$ ) along with the standardized coefficients  $\beta$ ; the latter are the ones shown in Figure 4.

[Insert Figure 4 here] [Insert Table 6 here]

A direct effect of 0.40 means that a 1% increase in sports performance implies an increase of 0.40% annual revenues. Then, the analysis of the indirect effect ( $0.69 \cdot 0.5159 = 0.356$ ) involves that a 1% rise in sports performance leads to increase the media visibility index by 0.69%; then, we find that a 1% increase in media visibility index increases annual revenues by 0.51%. Finally, aggregating both effects, we conclude that a 1% increase in sports performance increases indirectly the annual revenue by 0.35% through having increased media visibility.

We apply the Sobel-Goodman mediation tests to verify the statistical significance of the direct and total effect; while the indirect effect is tested by the Preacher-Hayes bootstrapping test. (The z-values delivered by Sobel-Goodman for the indirect effect are not valid). Based on the bootstrap results (1,000 repetitions) of the Preacher-Hayes test, we conclude that the indirect effect is also statistically significant, corroborating the existence of mediation on part of the media visibility variable.<sup>12</sup>

Notice the fact that the estimated coefficient for the total effect of League Points remains statistically significant when adding the mediator variable (Media Visibility): it decreased from 0.51 to 0.29, thus implying that a large part of the total effect is mediated through Media Visibility. The Table A.2.1 of the Appendix 2 reports the Sobel-Goodman mediation tests of statistical significance of the direct, indirect and total effects.<sup>13</sup> The results corroborate the importance of the indirect effect and the mediation effect of Media Visibility on the relationship of League Points on Annual Revenue.

<sup>11</sup> Zhao et al. (2010) show that the method by Baron and Kenny (1986), is no longer a valid procedure to test the indirect effect (i.e., Sobel and its variants) in the analysis of mediation.

<sup>12</sup> Some ideas about the discussion on the methodological aspects were retrieved on 15<sup>th</sup> December 2018, from: [http://ederosia.byu.edu/blog/Eric\\_DeRosia/using-stata-to-perform-the-preacher-and-hayes-1994-bootstrapped-test-of-mediation/](http://ederosia.byu.edu/blog/Eric_DeRosia/using-stata-to-perform-the-preacher-and-hayes-1994-bootstrapped-test-of-mediation/)

<sup>13</sup> See: <https://stats.idre.ucla.edu/stata/faq/how-to-perform-sobel-goodman-mediation-tests-in-stata/>, “The purpose of the Sobel-Goodman tests is to test whether a mediator carries the influence of an independent variable to a dependent variable. A variable may be considered a mediator to the extent to which it carries the influence of a given independent variable (IV) to a given dependent variable (DV). Generally speaking,

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3 The findings reached in this empirical analysis include the significant total effect (from sport  
4 performance towards revenue), reinforced by the prevailing mediation of Media Visibility, while the  
5 significant direct effect between sport performance and total revenue remains despite the inclusion  
6 of the mediator. In other words, there is not full mediation, a phenomenon that would occur if the  
7 effect of sport performance had changed from being significant to becoming not significant. But we  
8 found partial mediation of the Media Visibility variable, given the drop observed in the coefficient  
9 of the direct effect.  
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14 Thus, once we have examined how the mediation influences our model, we can focus again in the  
15 Model (4) of Table 6, which shows the results of estimating – through SEM techniques – the extended  
16 model illustrated in Figure 5.  
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20 [Insert Figure 5 here]  
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22 The estimations present good statistical properties, corroborating the hypothesis of the theoretical  
23 models described in Figure 3 and Figure 5. The root mean squared error of approximation (RMSEA)  
24 is smaller than 0.08. Besides, “pclose” is the probability that the RMSEA value is less than 0.05,  
25 interpreted as the probability that the predicted moments are close to the moments in the population.  
26 The reported CFI and TLI are two indices such that a value close to unity (greater than 0.95) indicates  
27 a good fit. CFI stands for comparative fit index and is possibly the most important one; whereas TLI  
28 stands for Tucker-Lewis index or non-normed fit index. Finally, the standardized root mean squared  
29 residual (SRMR), which is calculated using the first and second moments, indicates a better fit the  
30 closer SRMS is to zero (a good fit is a small value, considered by some to be limited to 0.08),<sup>14</sup>  
31 whereas, concerning the coefficient of determination (CD), which is like the R-squared for the whole  
32 model, a perfect fit corresponds to a CD of one. Besides, the signs and significance levels of the  
33 estimators are as expected according to the theory, and even the issue of mediation is manifest in the  
34 comprehensive model.  
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38 After completing the description of SEM analysis, in which our theoretical proposal involved a  
39 limited number of interrelations between the variables, we now examine the possibility for hiring  
40 decisions (spending in wage bills) to be made on the bases of media talent as well as sporting talent.  
41 This attempt is in line with previous works. In analysing the labour market for professional football  
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51 *mediation can be said to occur when (1) the IV significantly affects the mediator, (2) the IV significantly affects*  
52 *the DV in the absence of the mediator, (3) the mediator has a significant unique effect on the DV, and (4) the*  
53 *effect of the IV on the DV shrinks upon the addition of the mediator to the model.”*  
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57 <sup>14</sup> Using fit index Monte Carlo simulations, Hu and Bentler (1999) identify cut-point values to discriminate  
58 “good” from “bad” fitting SEM, concluding that CFI values  $\geq 0.95$  and RMSEA values  $\leq 0.08$  may define the  
59 well-fitting models. These cut-point values are *de facto* widely accepted as the SEM fit standard.  
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3 players, Garcia-del-Barrio and Pujol (2007) showed that both *in-field* sport performance and *off-field*  
4 skills, like media appeal and popularity, are valuable assets that must be rewarded.  
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7 Notice that there is another mediation effect that must be tested: the role League Points as a mediator  
8 in the relationship between Annual Wages and Media Visibility, as illustrated in Figure 6.  
9

10 [Insert Figure 6 here]  
11

12 The corresponding estimation results are reported in Table 7; while Table A.2.2 (in Appendix 2)  
13 reports the results of the Sobel-Goodman Mediation tests of statistical significance of direct, indirect  
14 and total effects, concerning the mediation of League Points in the relationship between the Annual  
15 Wages and Media Visibility.  
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18 [Insert Table 7 here]  
19

20 Again, we find that League Points fulfils the usual features required for a mediation effect concerning  
21 the relationship between Annual Wages and Media Visibility. We consider this a relevant empirical  
22 finding, insofar as it supports the hypothesis that, when making hiring decisions, team owners should  
23 also consider the players' ability to attract attention from the media (journalist) and from the fans.  
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26 **The managerial implications of our results are relevant and invite further research effort in the future.**  
27 **On the one hand, the empirical analyses support the theoretical linkages we postulate in the various**  
28 **models. Moreover, we find satisfactory results in almost all specification models, even if the most**  
29 **complex and comprehensive model (4) in Table 6 seems to outperform the others. It implies that**  
30 **media visibility plays a major role in the business of football and should be considered as an objective**  
31 **pursued by club owners. The debate is still open as to whether popularity can be considered an**  
32 **objective in itself or is a matter of desire as a mediating mechanism to achieve other goals.**  
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## 40 **5. Conclusions**

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42 This paper has applied SEM techniques to re-examine the debate on whether maximising wins  
43 (measured by League Points) or Profits is a more realistic description of football club owners'  
44 decisions in hiring talent. A novel feature of our empirical study is the use of the MERIT Media  
45 Visibility index to jointly measure the on-field and off-field skills of players. Our appraisals allowed  
46 us to evaluate the collective talent of football teams.  
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50 **According to our initial approach, there is a close link between squad quality (measured by annual**  
51 **wages) and economic profitability (captured through annual revenue). However, this relationship**  
52 **seems to be channelled through sporting performance and media visibility. Furthermore, in the more**  
53 **complex expanded model, there seems to be a link that also works in the opposite direction, as higher**  
54 **economic status (annual revenue) allows teams to reward players more generously in order to attract**  
55 **and retain talent. The main connections between these and other variables have been analysed in this**  
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3 paper by implementing a variety of SEM models, which corroborate the theoretical hypotheses  
4 previously postulated.  
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7 Our results provide evidence to support the idea that, when hiring players, in addition to consider the  
8 two traditional targets (wins and profits), club owners seem to try expanding also their teams' media  
9 exposure and popularity. More specifically, our different analyses lead us to conclude that the  
10 traditional empirical links between: (i) sporting talent (captured by annual wages) and sporting  
11 performance (measure by league points), as well as (ii) between league points and annual revenue,  
12 are both very strong, and involve also a key role played by the media visibility status of clubs.  
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17 The consistency and robustness of the results derives from the several specifications and statistical  
18 properties of the estimated models. Moreover, the conclusions are based on the analysis an extended  
19 data set with teams from four top European football leagues, comprising around 720 observations  
20 (80 teams per season and 9 seasons).  
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24 In summary, our empirical analysis (performed through applying path analysis approach) reveals that  
25 – to explain decisions for hiring talent in the football industry – the ability to attract attention from  
26 the media is as important as the sport performance might be. Moreover, based on the examination of  
27 the direct, indirect and total effects on Annual Revenue, we find that the Media Visibility index  
28 performs a mediation effect connecting Sport Performance (League Points) and Annual Revenues.  
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32 Given the crucial role of talent hiring in the football industry of entertainment, our results convey  
33 relevant managerial implications for club owners' decision making. The various analyses conducted  
34 in this paper reveal that the media visibility and popularity of players (and teams) is a major factor,  
35 although there may still be an open debate as to whether popularity should be considered an objective  
36 in itself or a means to pursue other, more conventional, ultimate objectives.  
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**Table 1.** Total Annual Revenue (Mill.€) – Main European Football Leagues

<b>Annual Revenue (Mill.€)</b>	<b>UEFA Champions League</b>	<b>French Ligue 1</b>	<b>Italian Serie A</b>	<b>Spanish La Liga</b>	<b>German Bundesliga</b>	<b>English Premier League</b>	<b>TOTAL Big-5</b>
<b>1995/96</b>		277	452	366	373	516	<b>1,984</b>
<b>1996/97</b>		293	551	524	444	692	<b>2,504</b>
<b>1997/98</b>		323	650	569	513	867	<b>2,922</b>
<b>1998/99</b>		393	714	612	577	998	<b>3,294</b>
<b>1999/00</b>		607	1,059	683	681	1,151	<b>4,181</b>
<b>2000/01</b>	553	644	1,151	676	880	1,397	<b>4,748</b>
<b>2001/02</b>	555	643	1,127	776	1,043	1,688	<b>5,277</b>
<b>2002/03</b>	664	689	1,152	847	1,108	1,857	<b>5,653</b>
<b>2003/04</b>	651	655	1,153	953	1,058	1,976	<b>5,795</b>
<b>2004/05</b>	700	696	1,219	1,029	1,236	1,975	<b>6,155</b>
<b>2005/06</b>	606	910	1,277	1,158	1,195	1,994	<b>6,534</b>
<b>2006/07</b>	819	972	1,064	1,326	1,379	2,273	<b>7,014</b>
<b>2007/08</b>	822	989	1,421	1,438	1,438	2,441	<b>7,727</b>
<b>2008/09</b>	820	1,048	1,494	1,501	1,575	2,326	<b>7,944</b>
<b>2009/10</b>	1,099	1,072	1,532	1,644	1,664	2,479	<b>8,391</b>
<b>2010/11</b>	1,145	1,040	1,553	1,718	1,746	2,515	<b>8,572</b>
<b>2011/12</b>	1,165	1,138	1,587	1,788	1,869	2,917	<b>9,298</b>
<b>2012/13</b>	1,424	1,297	1,682	1,859	2,018	2,946	<b>9,802</b>
<b>2013/14</b>	1,446	1,498	1,700	1,933	2,275	3,897	<b>11,303</b>
<b>2014/15</b>	1,497	1,418	1,790	2,053	2,392	4,401	<b>12,054</b>
<b>2015/16</b>	2,047	1,485	1,917	2,437	2,712	4,865	<b>13,416</b>
<b>2016/17</b>	2,104	1,643	2,075	2,854	2,793	5,297	<b>14,662</b>
<b>2017/18</b>	2,108	1,692	2,217	3,073	3,168	5,440	<b>15,590</b>
<b>2018/19</b>	2,816	1,902	2,495	3,377	3,345	5,851	<b>16,970</b>

Sources: Deloitte ARFF (2005-2020) | Deloitte FML (2009-19) | UEFA financial reports | Clubs' accounts.



**Table 2.** Revenue Growth Rates (%) | Averages of 5-years periods - European Football Leagues

Revenue Growth (%)	UEFA Champions League	French Ligue 1	Italian Serie A	Spanish La Liga	German Bundesliga	English Premier League	TOTAL Big-5
1996/97 to 2000/01	--	19.64	21.34	13.97	18.85	22.24	19.22
2001/02 to 2005/06	2.42	7.81	2.14	11.39	6.74	7.63	6.63
2006/07 to 2010/11	14.69	2.76	5.18	8.27	7.95	4.94	5.62
2011/12 to 2015/16	13.15	7.65	4.32	7.38	9.25	14.54	9.42
2016/17 to 2018/19*	12.19	8.68	9.21	11.56	7.33	6.38	8.16
<b>2009/10 to 2017/18</b>	<b>11.89</b>	<b>5.69</b>	<b>4.51</b>	<b>8.42</b>	<b>8.14</b>	<b>10.26</b>	<b>7.84</b>
<b>2000/01 to 2018/19</b>	<b>10.44</b>	<b>9.37</b>	<b>8.37</b>	<b>10.43</b>	<b>10.27</b>	<b>11.56</b>	<b>9.96</b>

Sources: Deloitte ARFF (2005-2020) | Deloitte FML (2009-19) | UEFA financial reports | Clubs' accounts.

\* Averages in this period cover three instead of five years.

Table 3. Descriptive Statistics of the Main Variables

	N.	Mean	Std. Dev.	Min.	Max.
<b>Annual Revenue</b>					
TOTAL	716	121,287	130,841	13,426	749,746
<i>By Season</i>					
2009-10	79	89,041	87,527	16,716	442,000
2010-11	79	89,695	88,526	18,128	480,000
2011-12	80	97,819	98,355	18,063	514,000
2012-13	80	101,218	104,735	19,004	521,000
2013-14	80	116,358	122,304	18,067	550,000
2014-15	79	127,229	136,566	18,858	578,000
2015-16	80	140,817	153,799	13,426	690,100
2016-17	79	161,428	161,662	28,591	676,110
2017-18	80	167,753	170,057	24,493	749,746
<i>By League</i>					
La Liga	179	106,889	156,287	16,716	749,746
Ligue 1	179	70,429	90,435	13,426	557,338
Premier L	179	193,881	140,734	53,936	690,100
Serie A	179	113,947	90,514	20,770	562,711
<b>Annual Wages</b>					
TOTAL	717	72,198	72,678	7,648	529,121
<i>By Season</i>					
2009-10	79	57,851	52,993	10,384	234,019
2010-11	79	59,219	53,622	9,731	231,868
2011-12	80	62,400	55,453	12,258	250,278
2012-13	80	63,088	59,285	8,916	271,988
2013-14	80	68,101	64,072	10,038	269,500
2014-15	80	71,088	75,396	10,909	340,367
2015-16	80	79,111	83,781	7,648	371,735
2016-17	79	89,074	85,938	13,280	406,109
2017-18	80	99,716	99,486	15,136	529,121
<i>By League</i>					
La Liga	179	62,812	87,434	8,916	529,121
Ligue 1	179	47,753	49,561	7,648	332,063
Premier L	179	120,652	73,310	27,244	334,154
Serie A	180	57,654	49,934	11,000	261,827
<b>League Points</b>					
TOTAL	720	52.08	16.79	17	102
<i>By Season</i>					
2009-10	80	52.01	16.61	19	99
2010-11	80	51.75	13.96	20	96
2011-12	80	51.45	15.45	22	100
2012-13	80	51.90	16.32	22	100
2013-14	80	52.46	18.00	23	102
2014-15	80	52.01	16.87	19	94
2015-16	80	51.98	16.21	17	96
2016-17	80	52.66	19.31	18	95
2017-18	80	52.45	18.56	20	100
<i>By League</i>					
La Liga	180	52.58	18.07	20	100
Ligue 1	180	51.61	14.80	18	96
Premier L	180	52.12	17.19	17	100
Serie A	180	51.99	17.06	18	102
<b>Media Visibility</b>					
TOTAL	720	19.06	32.46	0.07	252.44
<i>By Season</i>					
2009-10	80	20.07	33.23	0.32	145.10
2010-11	80	20.46	24.51	0.47	140.55

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2011-12	80	23.01	30.83	1.48	188.56
2012-13	80	20.44	23.98	1.16	134.73
2013-14	80	17.97	25.75	0.59	161.87
2014-15	80	15.03	29.61	1.47	170.30
2015-16	80	18.81	37.71	0.13	223.68
2016-17	80	16.31	41.44	0.07	252.44
2017-18	80	19.50	40.44	0.32	213.71
<i>By League</i>					
La Liga	180	27.11	50.46	0.13	252.44
Ligue 1	180	6.35	12.45	0.14	129.84
Premier L	180	27.33	30.13	2.14	140.33
Serie A	180	15.47	17.73	0.07	88.84

**Sources:** Wages and Revenue from Deloitte ARFF (2005-2020) | Deloitte FML (2009-19) | Club accounts and Data bases such as: Sabi, Aida, Amadeus and Hoovers Data. The points in domestic leagues from: [www.transfermarkt.de](http://www.transfermarkt.de) and the MERIT indexes on media visibility are the authors' own calculations.

Managerial Finance

**Table 4.** Path Coefficients of Structural Equation Models: Initial model with and without profits

	Initial Model		Profits Model	
	Model (1)		Model (2)	
	$\beta$	<i>SE</i>	$\beta$	<i>SE</i>
annual revenue → annual wages	0.9241 ***	0.0060	0.9383 ***	0.0051
annual wages → league points	0.4239 ***	0.0664	0.4335 ***	0.0728
league points → annual revenue	0.5180 ***	0.0587	0.5154 ***	0.0653
annual revenue → annual profits			2.2571 ***	0.0376
annual wages → annual profits			-1.4477 ***	0.0463
N. Obs.	716		699	
$\chi^2/(d.f.)$	0.00(0)		0.01(1)	
Prob > $\chi^2$	--		0.921	
RMSEA	0.000		0.000	
pclose (Prob. RMSEA ≤ .05)	1.000		0.967	
Comparative fit index (CFI)	1.000		1.000	
Tucker-Lewis index (TLI)	1.000		1.001	
SRMR	0.000		0.000	
Coefficient Determination (CD)	0.365		0.375	

Note: *b* = unstandardized coefficients | *SE* = standard error |  $\beta$  = standardized coefficients | RMSEA: Root mean squared error of approximation | SRMR: Standardized root mean squared residual.

\**p* < .05; \*\**p* < .01; \*\*\**p* < .001

**Table 5.** Path Coefficients of SEM and **Mediating** Analysis: models with media visibility

	Media Visibility Model		Extended Model	
	Model (3)		Model (4)	
	$\beta$	SE	$\beta$	SE
annual revenue → annual wages	0.9383 ***	0.0051	0.9242 ***	0.0068
annual wages → league points	0.4335 ***	0.0728	0.4769 ***	0.0635
league points → annual revenue	0.2136 ***	0.0604	0.2853 ***	0.0659
annual revenue → annual profits	2.2571 ***	0.0376	2.2571 ***	0.0383
annual wages → annual profits	-1.4477 ***	0.0463	-1.4477 ***	0.0441
league points → media visibility	0.5368 ***	0.0466	0.3600 ***	0.0533
media visibility → annual revenue	0.5621 ***	0.0367	0.3848 ***	0.0653
annual wages → media visibility			0.3115 ***	0.0770
N. Obs.	699		699	
$\chi^2/(d.f.)$	10.84(3)		0.13(2)	
Prob > $\chi^2$	0.013		0.937	
RMSEA	0.061		0.000	
pclose (Prob. RMSEA ≤ .05)	0.264		0.988	
Comparative fit index (CFI)	0.998		1.000	
Tucker-Lewis index (TLI)	0.995		1.002	
SRMR	0.010		0.001	
Coefficient Determination (CD)	0.375		0.507	

Note:  $b$  = unstandardized coefficients |  $SE$  = standard error |  $\beta$  = standardized coefficients | RMSEA: Root mean squared error of approximation | SRMR: Standardized root mean squared residual.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

**Table 6.** Mediation of Media Visibility in the relationship of League Points on Annual Revenue

	Path	<i>b</i>	<i>SE</i>	$\beta$
<b>Direct effects</b>				
league points → annual revenue	<i>c'</i>	0.9091 ***	0.0631	0.4000 ***
league points → media visibility	<i>a</i>	2.4014 ***	0.0940	0.6906 ***
media visibility → annual revenue	<i>b</i>	0.3372 ***	0.0181	0.5160 ***
<b>Indirect effects</b>				
league points → media visib. → annual revenue	<i>a·b</i>	0.8098 ***	0.0539	0.3563 ***
<b>Total effects</b>				
league points → media visibility	<i>a</i>	2.4014 ***	0.0940	0.6906 ***
media visibility → annual revenue	<i>b</i>	0.3372 ***	0.0181	0.5160 ***
league points → annual revenue	<i>c = c'+a·b</i>	1.7189 ***	0.0556	0.7563 ***
N. Obs.		717		717

Note: *b* = unstandardized coefficient; *SE* = standard error;  $\beta$  = standardized coefficient  
 \**p* < .05; \*\**p* < .01; \*\*\**p* < .001

**Table 7.** Mediation of League Points in the relationship of Annual Wages on Media visibility

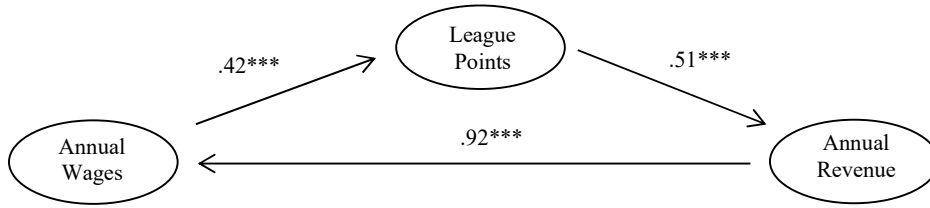
	Path	<i>b</i>	<i>SE</i>	$\beta$
<b>Direct effects</b>				
annual wages → media visibility	<i>c'</i>	0.9644 ***	0.0521	0.6242 ***
annual wages → league points	<i>a</i>	0.3344 ***	0.0111	0.7483 ***
league points → media visibility	<i>b</i>	0.7546 ***	0.1166	0.2183 ***
<b>Indirect effects</b>				
annual wages → league points → media visib.	<i>a·b</i>	0.2524 ***	0.0399	0.1633 ***
<b>Total effects</b>				
annual wages → league points	<i>a</i>	0.3344 ***	0.0111	0.7483 ***
league points → media visibility	<i>b</i>	0.7546 ***	0.1166	0.2183 ***
annual wages → media visibility	<i>c = c'+a·b</i>	1.2167 ***	0.0356	0.7875 ***
N. Obs.		717	717	

Note: *b* = unstandardized coefficient; *SE* = standard error;  $\beta$  = standardized coefficient

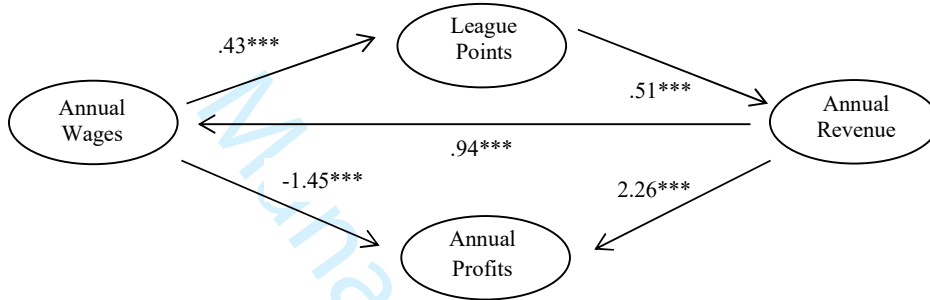
\**p* < .05; \*\**p* < .01; \*\*\**p* < .001



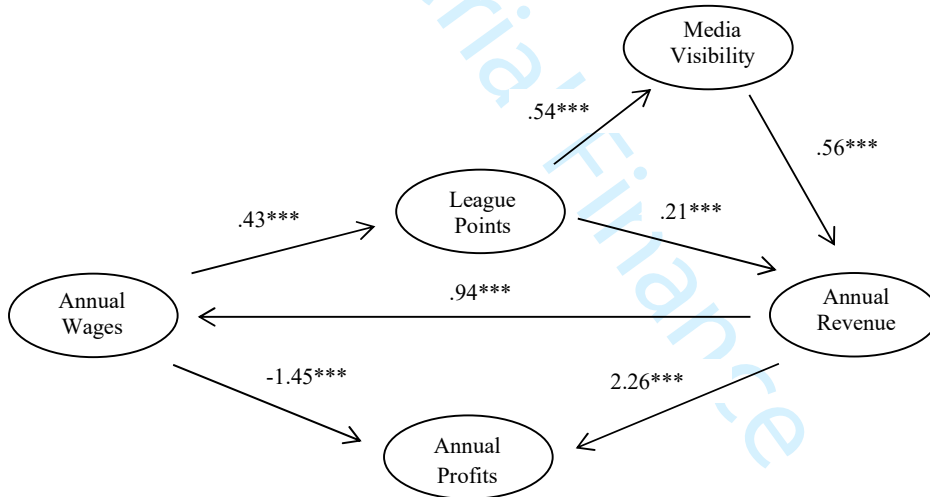
**Figure 1. Initial Model.** Annual Wages - League Points - Annual Revenue



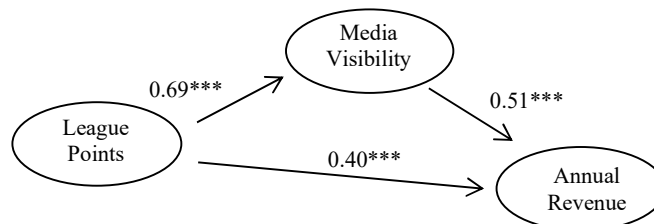
**Figure 2. Model with Profits.** Annual Wages - League Points - Annual Revenue - Annual Profits



**Figure 3. Model with Media Visibility (MV):** Mediating effect of Media Visibility on the relationship between League Points and Annual Revenue



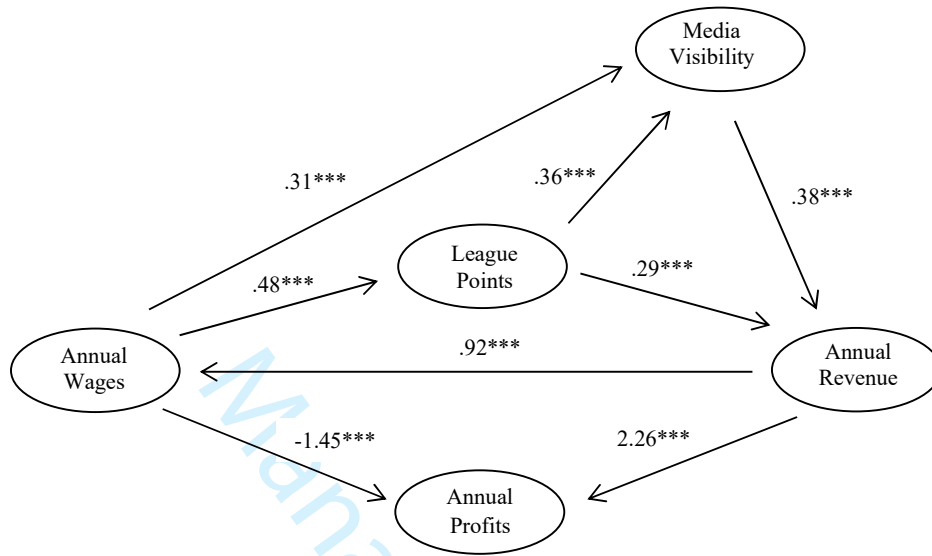
**Figure 4. Testing the Mediation of Media Visibility in the relationship of Sport Performance (League Points) on Annual Revenue**



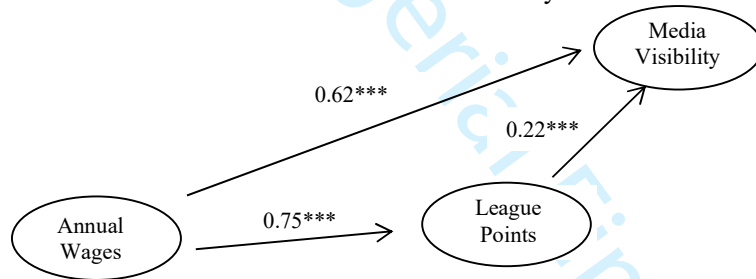
where:  $0.75632887 = 0.4000015 + 0.6905964 \cdot 0.5159705$ .

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**Figure 5. Extended model: Annual Wages – League Points - Media Visibility - Annual Revenue**  
(with two mediation effects)



**Figure 6. Testing the Mediation of League Points in the relationship of Annual Wages on Media visibility**



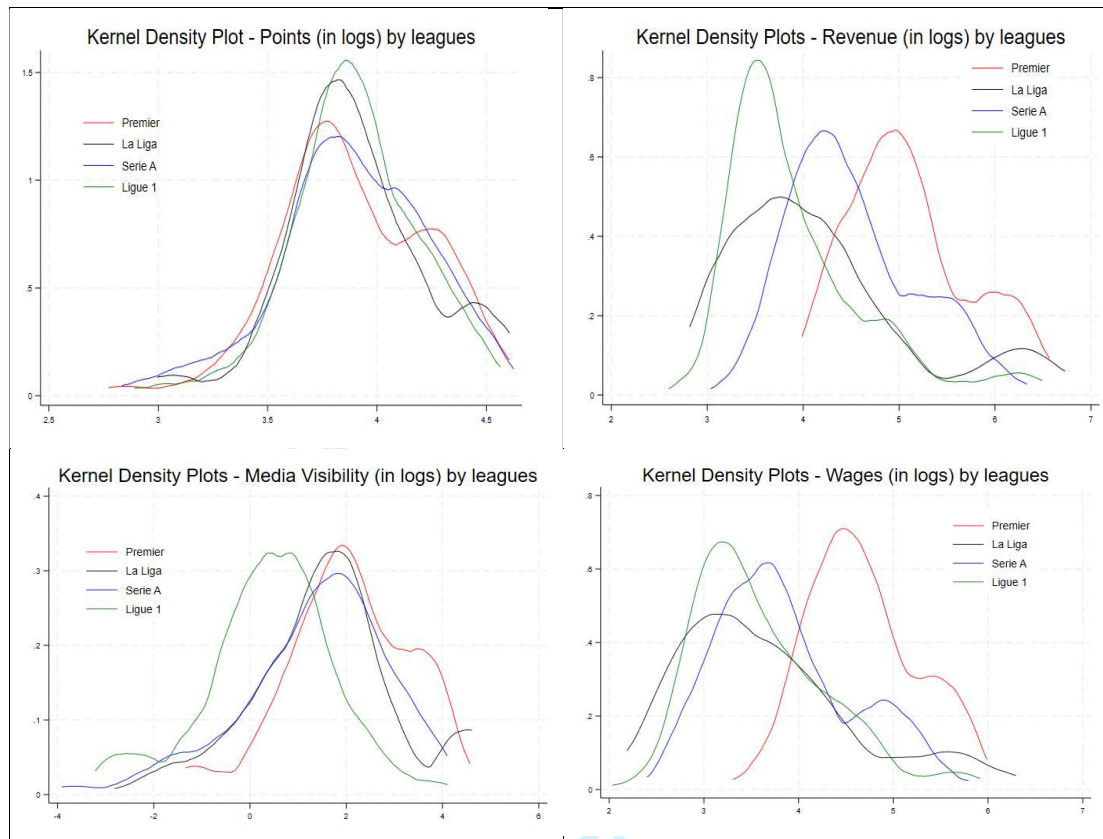
where:  $0.78752 = 0.62419 + 0.74825 \cdot 0.21829$ .

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**Appendix 1.**

**Figure 7. Kernel Density Plots of the Main Variables (in logs)**





### Appendix 3.

**Table A.3.1.** Estimations with Moderation Effects in the relationship of League Points on Annual Revenue

	Coefficient	OIM Std.Err.	z	P> z	[95% conf. interval]	
ln_mvi_perc						
ln_pts_perc	0.690596	0.017059	40.48	0.000	0.657161	0.724031
_cons	3.301769	0.202773	16.28	0.000	2.904340	3.699198
-----						
ln_rev_perc						
ln_mvi_perc	1.005312	0.011945	84.16	0.000	0.981899	1.028724
ln_pts_perc	0.444684	0.013716	32.42	0.000	0.417800	0.471567
ln_moderat	1.022158	0.024650	41.47	0.000	0.973845	1.070472
_cons	2.926046	0.094082	31.10	0.000	2.741649	3.110443
-----						
var(e.ln_mvi_perc)	0.523076	0.023561			0.478876	0.571356
var(e.ln_rev_perc)	0.036200	0.004557			0.028284	0.046332
-----						
LR test of model vs. saturated: chi2(1) = 2549.23					Prob > chi2 = 0.0000	

**Table A.3.2.** Mediation and Moderation Effects in the relationship of League Points on Annual Revenue

	Mediation alone		Mediation & Moderation	
	$\beta$	SE	$\beta$	SE
<i>Direct effects</i>				
league points → annual revenue	0.4000 ***	0.0631	0.4447 ***	0.0137
league points → media visibility	0.6906 ***	0.0940	0.6906 ***	0.0940
media visibility → annual revenue	0.5160 ***	0.0181	1.0053 ***	0.0119
points # media visibility → annual revenue			1.0221 ***	0.0246
N. Obs.		717	717	

According to the results shown in Table A.3.1 and Table A.3.2, for the model that includes the interaction of league points and media visibility, along with the mediation effects of the original model, there is a moderation effect that appears to be statistically significant.

The interpretation of the results is as follows: the *unconditional direct effect* of 0.44, meaning that a 1% increase in sports performance increases annual revenues by 0.44%. Although it is not reported in the table, the corresponding 95% confidence interval of (0.41,0.44) is significantly greater than 0.40 in the original mediation model. Then, the *unconditional indirect effect* is calculated as:  $1.0053 \cdot 0.69 = 0.69$ , which means that a 1% increase in sports performance increases annual revenues indirectly by 0.69% through increasing media visibility index. Hence, in the model, adding the moderation effect increases the indirect effect of sports performance on annual revenues. Finally, the (average) *conditional effect* is calculated as:  $1.0221 \cdot 3.3017 + 1.0221 \cdot 0.6906 \cdot (\text{average})$  performance. The qualitative interpretation would be as follows: increasing media visibility increases the effect of sports performance on annual revenues. Thus, a higher media visibility will increase the sports performance premium. This is the case since all the relevant estimators are positive (see Table A.3.1), and given that the (average) sporting performance is always positive too.