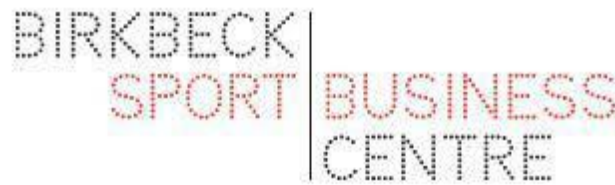# BIROn - Birkbeck Institutional Research Online

Garcia-del-Barrio, P. and Rossi, Giambattista (2019) Winners in the field versus winners in the media. Do clubs' owners maximise wins, revenues or visibility? Working Paper. Birkbeck Sport Business Centre, London, UK.

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Research Paper Series

**Winners in the field versus
winners in the media:
Do clubs' owners maximise
wins, revenues or visibility?**

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Winners in the field versus winners in the media. Do clubs' owners maximise wins, revenues or visibility?

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Abstract

Despite the large revenue growth rates exhibited in the main European football leagues, clubs seldom make profits. This paper applies SEM techniques to revisit the thrilling debate on whether maximising profits or sport performance is more realistic to describe clubs owners' decisions at hiring talent. Earlier papers advocate that football clubs usually behave as winning maximisers rather than as profit maximisers. First, taking into account the degree of media visibility of football clubs, we re-examine the relationship between: (i) sport talent and sport attainments; and (ii) sport performance and revenue. Then, we study the extent to which, in addition to the twofold choice between profits and sport performance, clubs' owners might also aim to maximizing their teams' visibility in the media. To verify this hypothesis, we calculate an index of media value, which jointly capture on-field and off-field skills of players, thereby assessing the global talent that football teams concentrate. Applying path analysis techniques and structural equation models (SEM), we find a significant mediation role of the media value index concerning the link between teams' sport performance and annual revenues.

1. Introduction

Professional sports are part of the entertainment industry, an economic sector that comprises also: television, movies, music, dance, fine arts, etc. The business of football, as part of the modern sports industry, is developed upon the sport talent and popularity of players. The players' capacity to generate revenues is largely driven by their exposure in the media and their popularity. Thus, both the on-field and off-field skills of players are considered major assets to build up football team brands.

Football players are highly skilled workers who display their exclusive talent in the playing field. Some individuals possess – along with sporting talent – other skills that make them popular. Previous papers assume that the appraisal of the players' contribution to their teams depends basically on their performance and sport attainments (Cf.: Scully (1974); Berri (1999); or Horowitz and Zappe (1998), among others)[1]. More recent research (Cf.: Garcia-del-Barrio and Pujol (2016) and Korzynski and Paniagua (2016)) stress that the players' ability to draw attention in the media is a key factor to explain hiring decisions in football.

This paper revisits the discussion on clubs' objectives and priorities. It actually examines whether clubs' owners try to maximise profits or sport performance when they make decisions for hiring talent. Some papers conclude that football clubs generally behave as win rather than profit maximising agents (Cf.: Sloane (1971); Késenne (1996); Zimbalist (2003); Késenne (2006); Vrooman (2007); Garcia-del-Barrio & Szymanski (2009); and Fort (2015)). Other studies assume instead that clubs typically aim to maximise profits (Cf.: El-Hodiri & Quirk (1971); Fort & Quirk (1995); Szymanski & Késenne (2004); Grossmann & Dietl (2009)). The literature mentions the existence of a trade-off between wins and profits (Dietl et al., 2008), which leads assuming that professional sport leagues are contest where clubs behave as "utility" maximisers of a weighted sum of wins and profits (Dietl et al., 2011).

However, other researchers believe that definitive conclusions on this debate cannot be achieved. On one hand, Fort and Quirk (2004) argue that comparisons between profit and win maximizing choices cannot be made without information on clubs' revenue functions. On the other hand, Zimbalist (2003) stresses the difficulty to distinguish – on the bases of empirical analysis – profit maximizing from other behaviour, and hence suggests that club owners are perhaps looking at maximizing long-term economic returns.

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[1] Moreover, Horowitz and Zappe (1998) explicitly recognise: "*it is generally acknowledged in the literature that player's economic rewards are based on sporting performance*". Franck and Nuesch (2012) introduced the distinction between on-field and off-field related news articles, to prove that players' market values are affected by both sport talent and popularity.

In this paper we carry out an empirical study – upon a rich data set – to explore if club owners, rather than facing a twofold choice, may be considering a third conceivable objective: maximising the visibility in the media and popularity of the club. Moreover, through applying structural model techniques, this paper explores the theoretical interactions between various alternative objectives presumably followed by club owners.

2. Economic context of the Football industry

In recent times we have witnessed an increasing prevalence of football as a provider of entertainment. According to Deloitte (Annual Review of Football Finance, 2018) the total revenues of European football in 2016/17 totalled €25.5 billion. The European market share of professional Football is largely dominated by the Big-5 domestic leagues: England, Spain, Italy, Germany and France, whose cumulative revenues accounted for €14.7 billion in season 2016/17, which means an increase of more than 11% with respect to the previous season. (In 2015/16 this figure was €12.0 billion). The growing trend in revenues of football teams and leagues has called attention of the researchers. Table 1 reports data on total annual revenues of the Big-Five domestic football leagues, as well as of the UEFA Champions League.

Table 1. Total Annual Revenue (Mill.€) – European Professional Football Leagues

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

Sources: Deloitte ARFF (2005-18) | Deloitte ARFF (1999-18) | UEFA financial reports | Clubs' accounts

A surprising feature characterising this industry is that, despite the large revenues obtained by the main football leagues, individual clubs seldom generate positive profits[2].

Elaboration on the data allows us identifying the leagues and periods in which the industry expansion was faster. Table 2 collects some calculations, by leagues, of the revenues growth rates for periods of 5 years, and also the average of the 20-years period.

Table 2. Revenues Growth Rates by periods (in %) – European Football Leagues

Revenue Growth (%)	UEFA Ch.League	Ligue 1	Serie A	La Liga	Bundesliga	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	6.62
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
1996/97 to 2015/16	**10.09**	**9.47**	**8.24**	**10.25**	**10.70**	**12.34**	**10.22**

Some comments follow on the financial situation of the leagues and their future perspectives. First, it seems that at the end of the last century, the football industry had an astonishing growth in terms of revenues, a feature that applies to all the leagues. Second, even if the figures are always positive, the analysis by periods reveals a negative impact of the recession: the growth rate slows down along with the business cycle. Third, regardless of the observed disparity across periods, all the Big-5 domestic football leagues increase their revenues, on average over the whole 20-years period, at a rate of around 10%. Forth, deviations from the pattern permit identifying the Premier League as a promising growing market.

3. Variables' Description and Data Sources

The empirical section of the paper estimates models involving two financial variables of football clubs: annual revenues and annual wage bills. The data includes clubs competing in the top division leagues of four of the "Big-5" domestic football competitions in Europe: England, Spain, Italy and France.

The analysis is actually carried out upon a sample of 557 (20 x 4 x 7) observations: The number of teams in the first division league times four of the "Big-5" leagues with public financial data times seven seasons: from 2009/10 to 2015/16. (The resulting 557 rather than 560 observations are due to three missing values on teams' revenues and/or wages). Table 3 summarises the descriptive statistics of the main variables for the empirical section.

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[2] Concerning the English football teams, Szymanski and Smith (1997) as well as Szymanski and Kuypers (2000) show that, even for the few clubs that enjoyed positive profits, average profits over time were small.

Table 3. Main Descriptive Statistics

	N.	Media	Std. Dev.	Min.	Max.
Annual Revenues					
TOTAL	557	108.9195	116.3909	13.4260	690.1000
By Season					
2009-10	79	89.0408	87.5265	16.7163	442.0000
2010-11	79	89.6950	88.5259	18.1283	480.0000
2011-12	80	97.8190	98.3545	18.0628	514.0000
2012-13	80	101.2180	104.7347	19.0044	521.0000
2013-14	80	116.3578	122.3041	18.0672	550.0000
2014-15	79	127.2286	136.5661	18.8578	578.0000
2015-16	80	140.8169	153.7992	13.4260	690.1000
By League					
La Liga	139	94.4543	142.6226	16.7163	620.1000
Ligue 1	140	65.1442	80.6368	13.4260	542.4000
Premier L	139	172.2171	124.9386	53.9358	690.1000
Serie A	139	104.1770	76.5944	20.7700	387.9000
Annual Wages					
TOTAL	558	65.8630	64.5183	7.6480	371.7350
By Season					
2009-10	79	57.8512	52.9931	10.3842	234.0190
2010-11	79	59.2186	53.6223	9.7314	231.8680
2011-12	80	62.3997	55.4531	12.2583	250.2783
2012-13	80	63.0879	59.2852	8.9160	271.9881
2013-14	80	68.1010	64.0720	10.0384	269.5000
2014-15	80	71.0881	75.3956	10.9088	340.3670
2015-16	80	79.1113	83.7805	7.6480	371.7350
By League					
La Liga	139	54.1491	72.0220	8.9160	371.7350
Ligue 1	140	44.4855	43.7339	7.6480	292.3940
Premier L	139	111.3643	68.6994	27.2438	322.9400
Serie A	140	53.6946	45.9920	11.0000	234.0190
Points in League					
TOTAL	560	51.9375	16.1606	17	102
By Season					
2009-10	80	52.0125	16.6121	19	99
2010-11	80	51.7500	13.9624	20	96
2011-12	80	51.4500	15.4517	22	100
2012-13	80	51.9000	16.3177	22	100
2013-14	80	52.4625	18.0048	23	102
2014-15	80	52.0125	16.8684	19	94
2015-16	80	51.9750	16.2106	17	96
By League					
La Liga	140	52.5642	17.8015	20	100
Ligue 1	140	51.4214	14.0605	18	96
Premier L	140	52.0357	16.6186	17	89
Serie A	140	51.7285	16.0878	19	102
Media Visibility					
TOTAL	560	19.39654	29.67185	0.13	223.68
By Season					
2009-10	80	20.06762	33.22802	0.32	145.10
2010-11	80	20.45887	24.50752	0.47	140.55
2011-12	80	23.00525	30.82988	1.48	188.56
2012-13	80	20.43975	23.97724	1.16	134.73
2013-14	80	17.96825	25.74800	0.59	161.87
2014-15	80	15.03025	29.60925	1.47	170.30
2015-16	80	18.80575	37.71482	0.13	223.68
By League					
La Liga	140	26.84079	44.98978	0.13	223.68
Ligue 1	140	6.13242	8.42768	0.47	70.00
Premier L	140	27.36314	28.75458	2.31	140.33
Serie A	140	17.24979	17.80904	1.16	88.84

The data sources on wages and revenues include: Deloitte Football Money League (1997-2018); Deloitte Annual Report of Football Finance (2005-2018); Clubs' financial accounts; and other databases, such as: Sabi, Aida, Amadeus and Hoovers Data. Unfortunately, data on teams' revenues and wages for the German Bundesliga was not available. Data on another variable used in our empirical study, sport performance (measured through the number of points accumulated the domestic league) was obtained from the official Web pages of the domestic leagues as well as from www.transfermarkt.de.

The index capturing the degree of exposure that clubs achieve in the media is one of the main variables of our empirical study. The procedure to calculate this visibility index (the teams' media value) is based on the MERIT approach (*Methodology for the evaluation and rating of intangible talent*). This methodology is able to jointly capture sport achievements along with other non-sport-related assets of players and teams, and to interpret these abilities as potential sources of economic returns. The basic guidelines of MERIT approach consist of computing the media value ratings associated to the degree of exposure in the media. We count the number of news articles that are associated to each player at a given time period. Building on individual ratings, we compute indexes to appraise the economic value of talent, which capture the players' sporting skills jointly with their personal off-field attractiveness. This is because their degree of exposure in the media is meant to stem from sport performance, but it derives also from the recognition of their social skills.

The MERIT individual index of media value is expressed with respect to the average of the top 2,500 players (from a data set of more than 5,000 individuals). The individual media value score is the factor by which the value of a particular player multiplies the number of news articles of the representative (average) player in our sample. Then, the media value of football clubs is derived by grouping the fifteen individuals with the greatest media value in the team. Similarly, by adding up individual media ratings, we obtain aggregate figures to appraise the comparative status of the domestic leagues. Ratings on teams' media visibility are taken from MERIT data collection. A more detailed description of the methodology for the appraisal of the economic value of talent is found at: www.meritsocialvalue.com.

4. Discusion of the Results

Our empirical study, carried out applying Structural Equation Models, corroborates the findings of earlier works. Colleague researchers prove a positive empirical link existing between spending in players' talent – as captured by the total annual wage bill – and sport achievements: Cf. Forrest & Simmons (2002); and Szymanski & Smith (1997), among others.

Also Szymanski & Smith (1997) report evidence of the correlation between sport performance (football teams' success) and teams' revenues.[3] Nonetheless, in line with previous studies (Cf.: Garcia-del-Barrio & Pujol (2007); Garcia-del-Barrio & Pujol (2009), for instance), we advocate in this paper that the relationship between talent reward and sport performance, as well as between sport attainment and potential revenues, must be examined along with the appraisals of the clubs' media value status.

As mentioned, previous research recognises the role of skills for attracting media attention in the context of football clubs' strategic hiring decisions. This is due to the fact that clubs aim to achieve not just sporting attainments and titles, but also to increase their exposure in the media, as a way to secure higher revenues in the long-run. Our paper precisely discloses that the debate on whether football clubs try to maximize sport outcomes or profits needs to be extended to account for a third objective: increasing the visibility in the media, a feature that interacts with the two traditional goals. Thus, as regards to the main question of the paper (whether clubs' owners try to maximize profit or sport performance), we claim that the clubs' objectives go beyond the twofold choice. Actually, this paper provides evidence to support that clubs' owner may be in search of expanding their media exposure and popularity status.

4.1. Path and Mediation Analysis of the Baseline Model

In this section we explore, through Structural Equation Model (SEM) techniques, interactions between alternative objectives of club owners at hiring talent. We first estimate a model involving revenues along with 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 (along with the traditional links between: (i) sport talent and sport attainments; and (ii) sport performance and potential revenues) the influence of team revenues on salaries altogether, in the way Figure 1 illustrates.[4]

Figure 1. Initial model: Annual Wages (AW) - Sport Performance (SP) - Total Revenues (TR)

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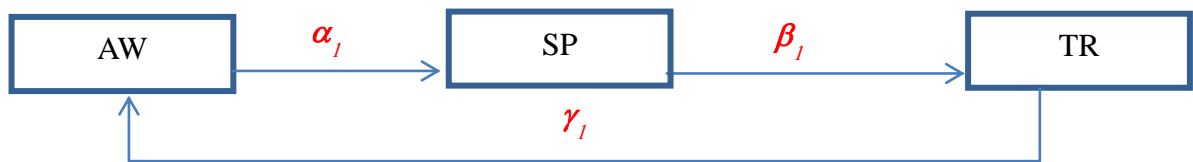
[3] While most sports economists would agree that sporting success is a major driving force for financial success, other papers recognize the role played by brand investments: Cf. Gladden & Milne (1999); Pawlowski & Anders (2012); Rohde & Breuer (2016a); and Rohde & Breuer (2016b).

[4] Actually, our paper, among other results, unclose the usual suspect of reverse causality is unveiled, given the positive effect of team revenues on salaries; a result that is similar to the one reported by Brown & Jepsen (2009) for the American MLB (Major League Baseball).

In the empirical analysis, the variables are expressed in natural logarithms as well as in deviations from the leagues' average, which enables controlling possible trends over time and discarding distortions stemming from inflation. We actually find that the estimated coefficient γ_1 (running from total revenues "TR" to annual salaries "AW") is statistically significant, which indicates that the causality link goes from "TR" to "AW". More importantly, we argue that the aforementioned traditional links (between: (i) sport talent and sport attainments; and (ii) sport performance and potential revenues) must be re-examined once the variables measuring the football clubs' media value status are included.

The analysis is developed by applying structural equation model (SEM), a methodology apropos to achieve this paper's objectives. The main linkages of our theoretical model are illustrated in Figure 2, which hypothesises that media value (MV) is a target itself, while it is a mediator element towards increasing the clubs' revenues too.

Figure 2. Baseline model: Annual Wages - Sport Performance - Media Value - Total Revenues
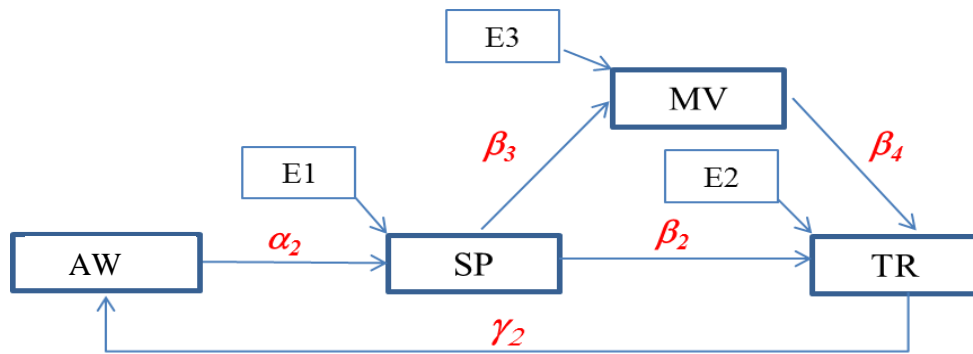
According to our declared objectives, before proceeding to estimate the whole theoretical model as described in Figure 2, we must verify the existence of a mediator role of some principal variables. Actually, the inclusion of the media value status (MV) – among the clubs' objectives – requires that mediation analysis is performed 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 value index fulfils a mediation role. We follow the methodological description made in Bernardo et al. (2012) and Zhao et al. (2010). The latter paper shows that the method proposed by Baron & Kenny (1986), widely applied in the past, is not any longer recognised as a valid procedure to test mediation.

Regression-based tests of the direct and the total effect are acceptable, but the procedure described in Baron and Kenny to test the indirect effect (i.e., Sobel and its variants) is not

accepted nowadays. According to Zhao et al. (2010), the most acceptable solution to test the indirect effect is applying the Preacher & Hayes (2004) bootstrapping test.[5] Moreover, the latter paper recommends using SEM for assessing mediation since it permits controlling for measurement error and it also provides a way for exploring potential mediation effects.

Figure 3. Testing the mediation of Media Value (MV)
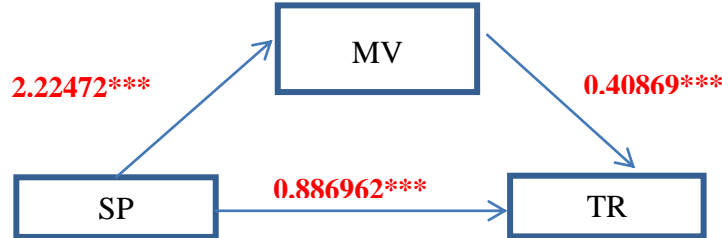
where: $\beta_1 = \beta_2 + \beta_3 \cdot \beta_4$ or: $1.79621 = 0.886962 + 2.22472 \cdot 0.40869$, and the significance levels are indicated as: * p<0.1; ** p<0.05; *** p<0.01.

Table 4 shows the results of estimating a model where the direct, indirect and total mediation are disentangled. (The estimations of this model give the coefficients displayed in Figure 3).

Table 4. Estimation of the mediation model for Media Value (MV)

```
Model with dv regressed on iv (path c)
     Source |       SS          df       MS          Number of obs   =       557
------------+------------------------------          F(1, 555)       =    727.44
      Model | 167.648522          1  167.648522      Prob > F        =    0.0000
   Residual | 127.906694        555  .230462512      R-squared       =    0.5672
------------+------------------------------          Adj R-squared   =    0.5665
      Total | 295.555216        556  .53157413       Root MSE        =    .48007
-------------------------------------------------------------------------------
 ln_rev_perc |    Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------+------------------------------------------------------------------
 ln_pts_perc |  1.796207   .0665973    26.97   0.000     1.665393    1.927021
       _cons | -1.518397   .1062659   -14.29   0.000     -1.72713   -1.309665
-------------------------------------------------------------------------------

Model with mediator regressed on iv (path a)
     Source |       SS          df       MS          Number of obs   =       557
------------+------------------------------          F(1, 555)       =    516.97
      Model |  257.18222          1   257.18222      Prob > F        =    0.0000
   Residual | 276.099793        555  .497477105      R-squared       =    0.4823
------------+------------------------------          Adj R-squared   =    0.4813
      Total | 533.282013        556  .959140311      Root MSE        =    .70532
-------------------------------------------------------------------------------
 ln_mvi_perc |    Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------+------------------------------------------------------------------
 ln_pts_perc |  2.224728    .097846    22.74   0.000     2.032535    2.416922
       _cons | -2.380625   .1561278   -15.25   0.000    -2.687299   -2.073952
-------------------------------------------------------------------------------

Model with dv regressed on mediator and iv (paths b and c')
     Source |       SS          df       MS          Number of obs   =       557
------------+------------------------------          F(2, 554)       =    723.98
      Model | 213.766815          2  106.883407      Prob > F        =    0.0000
   Residual |  81.7884018       554  .147632494      R-squared       =    0.7233
------------+------------------------------          Adj R-squared   =    0.7223
      Total | 295.555216        556  .53157413       Root MSE        =    .38423
```

---

[5] Some ideas of this methodological discussion were retrieved on the 15th December 2018, from:
http://ederosia.byu.edu/blog/Eric_DeRosia/using-stata-to-perform-the-preacher-and-hayes-1994-bootstrapped-test-of-mediation/

```
--------------------------------------------------------------------------------
ln_rev_perc |      Coef.   Std. Err.       t    P>|t|     [95% Conf. Interval]
-------------+------------------------------------------------------------------
 ln_mvi_perc |    .408699   .0231237    17.67   0.000     .3632781    .4541199
 ln_pts_perc |   .8869628   .0740786    11.97   0.000     .7414534    1.032472
       _cons |  -.5454381   .1013126    -5.38   0.000    -.7444418   -.3464343
--------------------------------------------------------------------------------
```

Then, we apply the Sobel-Goodman mediation tests, as shown in Table 5, 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 have been crossed out to indicate that they 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 MV variable. Moreover, the fact that the estimated coefficient for the total effect of sport performance (SP) remains statistically significant when including the mediator variable (MV), (it decreased from 1.796207, with a t-statistic of 26.97, down to 0.8869628, with a t-statistic equal to 11.97) means that moderation effect, rather than pure mediation, exists. Actually, it seems that 50% of the total effect is mediated.[6]

Table 5. Tests of the statistical significance of the direct, indirect and total effects for MV

```
                    Coef         Std Err      Z      P>|Z|
Sobel              .90924426    .06515867   13.95       0
Goodman-1 (Aroian) .90924426    .06519794   13.95       0
Goodman-2          .90924426    .06511938   13.96       0

                    Coef        Std Err     Z          P>|Z|
a coefficient   =  2.22473    .097846    22.7370        0
b coefficient   =  .408699    .023124    17.6744        0
Indirect effect =  .909244    .065159    13.9543        0
  Direct effect =  .886963    .074079    11.9733        0
   Total effect = 1.79621     .066597    26.9712        0

Proportion of total effect that is mediated:  .50620237
Ratio of indirect to direct effect:           1.0251211
Ratio of total to direct effect:              2.0251211
--------------------------------------------------------------------------------
Bootstrap results                          Number of obs    =        557
                                           Replications     =       1000
    command:  sgmediation ln_rev_perc, iv(ln_pts_perc) mv(ln_mvi_perc)
      _bs_1:  r(ind_eff)
--------------------------------------------------------------------------------
            |    Observed              Bootstrap
            |     Coef.       Bias    Std. Err.  [95% Conf. Interval]
-------------+------------------------------------------------------------------
      _bs_1 |  .90924426   .0028231   .09265245    .7363204   1.095753   (P)
--------------------------------------------------------------------------------
(P)    percentile confidence interval
```

[6] According to 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, mediation can be said to occur when (1) the IV significantly affects the mediator, (2) the IV significantly affects the DV in the absence of the mediator, (3) the mediator has a significant unique effect on the DV, and (4) the effect of the IV on the DV shrinks upon the addition of the mediator to the model.*" We use unstandardized values, since the *Sobel test* needs them to compute the significance of indirect effects.

The findings reached in this empirical analysis include the significant total effect (from sport performance towards revenues), reinforced by the prevailing mediation of Media Value (MV), while the significant direct effect between sport performance and total revenues remains despite the inclusion of MV as mediator.

In other words, there is not full mediation, a phenomenon that would occur if the effect of sport performance (SP) had changed from being significant to being not significant. But we have found partial mediation of Media Value (MV) on total revenues (TR), given the reduction observed in the value of the direct effect.

According to Gùardia-Olmos (2016), defining a SEM model implies assuming an underlying theoretical framework for establishing linkages between observable variables (Path Analysis) or latent variables (SEM) or for modelling general structural equations that define multiple relations between exogenous and endogenous variables.

Thus, once we have examined the role of mediation and how it affects our model, Table 6 presents the main results of estimating – through SEM techniques – the comprehensive baseline model.

The estimation results enjoy sound statistical properties and corroborates the hypothesis behind the theoretical model described in Figure 2. The model delivers very satisfying statistical properties. First, the root mean squared error of approximation (RMSEA) should be smaller than 0.08.[7] Then, "Pclose" is the probability that the RMSEA value is less than 0.05, interpreted as the probability that the predicted moments are close to the moments in the population. Second, the reported CFI and TLI are two indices such that a value close to unity (greater than 0.95) indicates a good fit. CFI stands for comparative fit index and is possibly the most important one; whereas TLI stands for Tucker-Lewis index or non-normed fit index. Finally, the standardized root mean squared residual (SRMR), which is calculated using the first and second moments, indicates a better fit the closer SRMS is to zero (a good fit is a small value, considered by some to be limited to 0.08); whereas, concerning the coefficient of determination (CD), which is like the R^2 for the whole model, a perfect fit corresponds to a CD of one.

Note that all the signs and significance levels of the estimators are as expected according to the theory, and even the issue of mediation is manifest in the comprehensive baseline model.

---

[7] Under population error, the root mean squared error of approximation (RMSEA) value is reported along with the lower and upper bounds of its 90% confidence interval. If the lower bound is below 0.05, one should not reject the hypothesis that the fit is close. If the upper bound is above 0.10, one should not reject the hypothesis that the fit is poor. The logic is to perform one test on each end of the 90% confidence interval and thus have 95% confidence in the result.

Table 6. Estimation of the comprehensive baseline model with one mediator: Media Value (MV)

```
Structural equation model                      Number of obs      =        557
Estimation method  = ml
Log likelihood     = -934.31584
-----------------------------------------------------------------------------------
                   |                OIM
                   |    Coef.   Std. Err.     z     P>|z|    [95% Conf. Interval]
-------------------+---------------------------------------------------------------
Structural         |
  ln_wag_perc      |
      ln_rev_perc  |  .9041214   .0135179   66.88   0.000    .8776268    .930616
            _cons  |  .1533105   .0199716    7.68   0.000    .1141668   .1924541
-------------------+---------------------------------------------------------------
  ln_pts_perc      |
      ln_wag_perc  |  .1945521   .0305234    6.37   0.000    .1347273   .2543769
            _cons  |  1.308577   .0414798   31.55   0.000    1.227278   1.389876
-------------------+---------------------------------------------------------------
  ln_rev_perc      |
      ln_pts_perc  |  .4152697    .141782    2.93   0.003    .1373821   .6931573
      ln_mvi_perc  |  .4488773   .0306983   14.62   0.000    .3887096   .5090449
            _cons  |  .1489594   .1970757    0.76   0.450   -.2373019   .5352206
-------------------+---------------------------------------------------------------
  ln_mvi_perc      |
      ln_pts_perc  |  1.666312   .1674135    9.95   0.000    1.338188   1.994437
            _cons  | -1.506066   .2639841   -5.71   0.000   -2.023465  -.9886666
-------------------+---------------------------------------------------------------
var(e.ln_wag_perc)|  .0515496   .0031143                     .0457932   .0580296
var(e.ln_pts_perc)|  .0488061   .0049065                     .0400776   .0594354
var(e.ln_rev_perc)|  .1612726   .0122713                     .1389287     .18721
var(e.ln_mvi_perc)|   .524781   .0359596                     .4588293   .6002126
-----------------------------------------------------------------------------------
LR test of model vs. saturated: chi2(1)   =     15.94, Prob > chi2 = 0.0001
```

```
    Fit statistic          |   Value   Description
    ---------------------+------------------------------------------------------
    Population error       |
               RMSEA |    0.164   Root mean squared error of approximation
     90% CI, lower bound |    0.099
            upper bound |    0.239
                 pclose |    0.002   Probability RMSEA <= 0.05
    ---------------------+------------------------------------------------------
    Fit statistic          |   Value   Description
    ---------------------+------------------------------------------------------
    Baseline comparison  |
                    CFI |    0.994   Comparative fit index
                    TLI |    0.963   Tucker-Lewis index
    ---------------------+------------------------------------------------------
    Fit statistic          |   Value   Description
    ---------------------+------------------------------------------------------
    Size of residuals    |
                   SRMR |    0.010   Standardized root mean squared residual
                     CD |    0.367   Coefficient of determination
```

4.2. Path and Mediation Analysis of the Extended Model

After completing the description of SEM for the baseline model, in which our theoretical proposal involved a limited number of interrelations between the variables, we now examine the possibility for hiring decisions (spending in wage bills) to be made on the bases of media talent as well as sporting talent. In their analysis of the labour market for professional football players, Garcia-del-Barrio and Pujol (2007) showed that both in-field (sport performance) and off-field skills (media value and popularity) are valuable assets that must be rewarded.

According to this rationale, we want exploring if the initial "baseline model" may be improved by an encompassing "extended model", where a causality link from annual wages (AW) to media value (MV) is added up, as illustrated in Figure 4.

Figure 4. Extended model: Annual Wages - Sport Performance - Media Value - Total Revenues
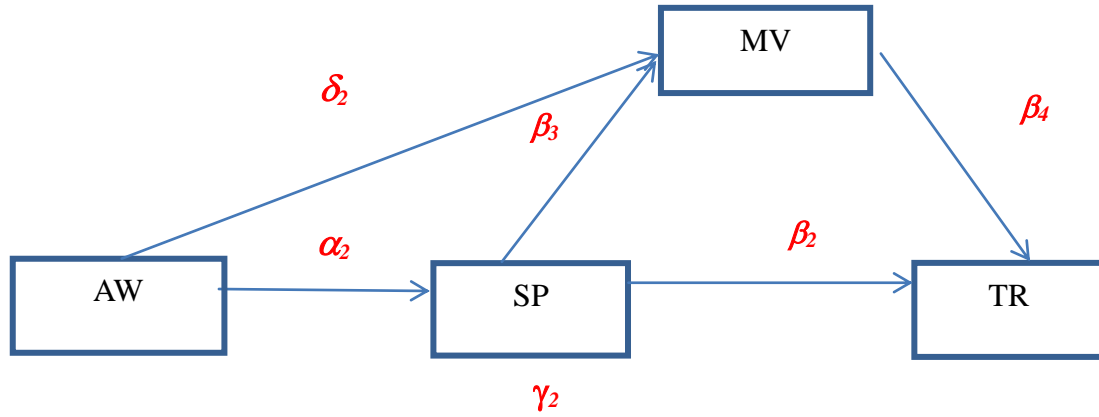
Again, before we estimate the comprehensive "extended model", a new potential mediation effect must be tested, which this time relates to the role of sport performance (SP).

Figure 5. Testing the mediation of Sport Performance (SP)
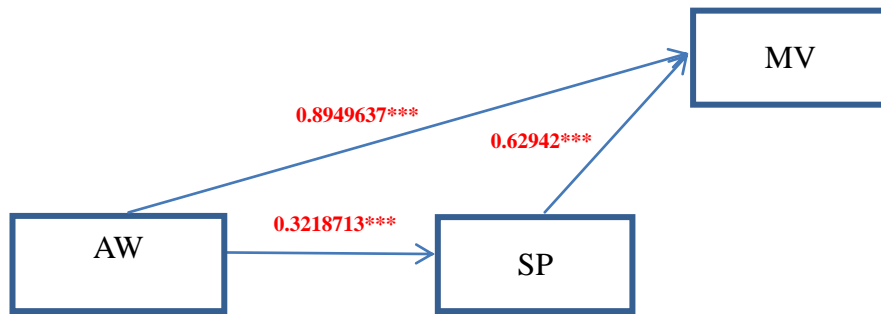
where: $\delta_1 = \delta_2 + \alpha_2 \cdot \beta_3$ or: $1.097557 = 0.8949637 + 0.3218713 \cdot 0.62942$, and the significance levels are indicated as: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

The results of the estimation are then reported in Table 7, while Table 8 shows the similar statistical test as those discussed for the mediation effect of MV.

Again, we find that sport performance (SP) fulfils the usual characteristics of mediation in the relationship affecting annual wages (AW) and media value (MV). This is an important empirical finding, which confirms our hypothesis that, when making hiring decisions, we must also account for the players' ability to attract the attention of the journalist and of the mass media.

Table 7. Testing the mediation of Sport Performance (SP)

```
Model with dv regressed on iv (path c)
      Source |       SS           df       MS            Number of obs   =        558
-------------+------------------------------           F(1, 556)       =    1007.46
       Model | 343.655554          1  343.655554       Prob > F        =     0.0000
    Residual | 189.657637        556  .341110858        R-squared       =     0.6444
-------------+------------------------------           Adj R-squared   =     0.6437
       Total | 533.313191        557  .957474311        Root MSE        =    .58405
--------------------------------------------------------------------------------
  ln_mvi_perc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+------------------------------------------------------------------
  ln_wag_perc |   1.097557   .0345791    31.74   0.000     1.029635    1.165479
        _cons |  -.3482452    .052005    -6.70   0.000    -.4503955   -.2460949
--------------------------------------------------------------------------------


Model with mediator regressed on iv (path a)
      Source |       SS           df       MS            Number of obs   =        558
-------------+------------------------------           F(1, 556)       =     705.76
       Model | 29.5551894          1  29.5551894       Prob > F        =     0.0000
    Residual | 23.2837199        556  .041877194        R-squared       =     0.5593
-------------+------------------------------           Adj R-squared   =     0.5586
       Total | 52.8389093        557  .094863392        Root MSE        =    .20464
--------------------------------------------------------------------------------
  ln_pts_perc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+------------------------------------------------------------------
  ln_wag_perc |   .3218713   .0121159    26.57   0.000     .2980729    .3456698
        _cons |   1.138595   .0182216    62.49   0.000     1.102803    1.174387
--------------------------------------------------------------------------------


Model with dv regressed on mediator and iv (paths b and c')
      Source |       SS           df       MS            Number of obs   =        558
-------------+------------------------------           F(2, 555)       =     542.72
       Model | 352.879948          2  176.439974       Prob > F        =     0.0000
    Residual | 180.433243        555  .325104942        R-squared       =     0.6617
-------------+------------------------------           Adj R-squared   =     0.6605
       Total | 533.313191        557  .957474311        Root MSE        =    .57018
--------------------------------------------------------------------------------
  ln_mvi_perc |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+------------------------------------------------------------------
  ln_pts_perc |   .6294232   .1181641     5.33   0.000     .3973196    .8615268
  ln_wag_perc |   .8949637   .0508543    17.60   0.000     .7950732    .9948542
        _cons |  -1.064903   .1438016    -7.41   0.000    -1.347365   -.7824413
--------------------------------------------------------------------------------
```

Table 8. Tests of the statistical significance of the direct, indirect and total effects

```
                        Coef         Std Err       Z           P>|Z|
  Sobel                 .20259328    .03879064    5.223       1.763e-07
  Goodman-1 (Aroian)    .20259328    .03881705    5.219       1.797e-07
  Goodman-2             .20259328    .03876421    5.226       1.729e-07


                        Coef       Std Err     Z         P>|Z|
  a coefficient   =   .321871    .012116    26.5661        0
  b coefficient   =   .629423    .118164     5.32669    1.0e-07
  Indirect effect =   .202593    .038791     5.22274    1.8e-07
    Direct effect =   .894964    .050854    17.5986         0
    Total effect =   1.09756    .034579    31.7405         0


  Proportion of total effect that is mediated:  .18458565
  Ratio of indirect to direct effect:           .22637037
  Ratio of total to direct effect:              1.2263704
  Bootstrap results                             Number of obs    =        558
                                                Replications     =       1000
        command:  sgmediation ln_mvi_perc, iv(ln_wag_perc) mv(ln_pts_perc)
         _bs_1:  r(ind_eff)
--------------------------------------------------------------------------------
             |   Observed              Bootstrap
             |      Coef.     Bias    Std. Err.  [95% Conf. Interval]
-------------+------------------------------------------------------------------
       _bs_1 |  .20259328   .0014823  .03741971   .1340545    .2777422  (P)
--------------------------------------------------------------------------------
  (P)    percentile confidence interval
```

Finally, Table 9 reports the results of the estimations as well as the corresponding tests to check the statistic properties that give support to our model.

Table 9. Estimation of the comprehensive extended model with two mediation effects: MV and SP

```
Structural equation model                      Number of obs     =        557
Estimation method  = ml
Log likelihood     = -926.3465
--------------------------------------------------------------------------------
                 |               OIM
                 |    Coef.   Std. Err.     z    P>|z|    [95% Conf. Interval]
-----------------+--------------------------------------------------------------
Structural       |
  ln_wag_perc    |
      ln_rev_perc |  .8825051  .0140519   62.80  0.000     .854964    .9100462
            _cons |  .1812976  .0206186    8.79  0.000     .1408859   .2217093
-----------------+--------------------------------------------------------------
  ln_pts_perc    |
      ln_wag_perc |  .2149884  .0263018    8.17  0.000     .1634378    .266539
            _cons | 1.281521   .0359967   35.60  0.000    1.210969   1.352073
-----------------+--------------------------------------------------------------
  ln_rev_perc    |
      ln_pts_perc |  .6122436  .1556929    3.93  0.000     .3070911   .9173962
      ln_mvi_perc |  .2972429  .0485836    6.12  0.000     .2020208   .3924651
            _cons |  .0078163  .2109389    0.04  0.970    -.4056163   .4212489
-----------------+--------------------------------------------------------------
  ln_mvi_perc    |
      ln_wag_perc |  .5011336  .0973276    5.15  0.000     .310375    .6918922
      ln_pts_perc | 1.026796   .1631832    6.29  0.000     .706963   1.346629
            _cons | -1.16794   .1834548   -6.37  0.000    -1.527505  -.8083752
-----------------+--------------------------------------------------------------
var(e.ln_wag_perc)|  .0524316  .0032265                    .0464742   .0591527
var(e.ln_pts_perc)|  .0463822  .0039769                    .0392073    .05487
var(e.ln_rev_perc)|   .178481  .0162034                    .149388    .2132399
var(e.ln_mvi_perc)|  .3634394   .02998                     .3091837   .4272158
--------------------------------------------------------------------------------
LR test of model vs. saturated: chi2(0)   =       0.00, Prob > chi2 =      .
```

```
     Fit statistic        |   Value   Description
    ---------------------+-----------------------------------------------------
    Population error     |
                  RMSEA |   0.000   Root mean squared error of approximation
     90% CI, lower bound |   0.000
            upper bound |   0.000
                  pclose |   1.000   Probability RMSEA <= 0.05
    ---------------------+-----------------------------------------------------
    Fit statistic        |   Value   Description
    ---------------------+-----------------------------------------------------
    Baseline comparison  |
                    CFI |   1.000   Comparative fit index
                    TLI |   1.000   Tucker-Lewis index
    ---------------------+-----------------------------------------------------
    Fit statistic        |   Value   Description
    ---------------------+-----------------------------------------------------
    Size of residuals    |
                   SRMR |   0.000   Standardized root mean squared residual
                     CD |   0.518   Coefficient of determination
```

Notice that "*in principle an RMSEA of zero does not disqualify it as a criterion to evaluate the model fit, since this should be happening about half of the cases where the model are perfectly specified. Moreover, the fact that RMSEA is equal to zero (and CFI to one) does not imply there is no discrepancy between the sample and model-implied covariance matrices, but occurs if the degrees of freedom are greater than the chi-square statistic.*"

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In summary, our empirical analysis reveals that, in the football industry, to explain decisions for hiring talent, the ability to attract attention from the media is as important as the sport performance might be. Another interesting feature of the proposed approach is that it complements the economic viewpoint by taking into account the degree of support given by fans and the media to the football teams. Based on the examination of direct, indirect and total effect on revenues, we find that the media value index (MV) has a protagonist role and mediation effect connecting sport performance and total revenues.

Regarding the main question of the paper, concerning the clubs' owners attempt to maximize profit or sport performance, we find that, rather than a twofold choice, the right approach should not neglect considering as well the possibility that clubs' owner trying to maximise the popularity and degree of visibility in the media.

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