

Annex E – Player Spending and Sporting Success

State of the Game

1. Introduction

Player spending is an important factor in determining sporting success, but it is not the only factor affecting performance. This annex provides an analysis of the relationship between player wage spending and sporting success across the top four divisions of English football.

The analysis considers whether higher player wage spending is associated with stronger sporting performance and whether the strength of this relationship differs across divisions.

The analysis is intended to identify the strength and direction of the association between player wages and sporting performance. The results should not be interpreted as establishing a causal relationship between player wage spending and sporting success. Isolating the causal effect is challenging because spending and sporting success can influence one another, while other factors can affect both. For example, greater spending may support stronger performance, while sporting success can itself increase the financial resources available to clubs and their subsequent ability to spend. The analysis also does not seek to identify player wages as the sole determinant of sporting success or to explain all the factors that determine clubs' performance on the pitch. It focuses on player wages and does not analyse the relationship between wages and transfer fees or between transfer fees and sporting success.

The annex is structured as follows:

- **Section 2** outlines the main drivers of sporting success and summarises the existing evidence
- **Section 3** describes the data used and the analytical approach
- **Section 4** presents analysis of the relationship between player wage spending and sporting success using descriptive evidence and econometric modelling

2. Background

Drivers of sporting success

The quality of a club's playing squad is a key driver of sporting success, and spending can affect the quality of players a club is able to recruit. However, sporting performance is not determined by spending alone. Sporting performance reflects both the resources available to a club and how effectively those resources are spent, alongside an element of uncertainty. These can be broadly characterised as three factors:

- **Level of spend:** clubs that spend more on players than their rivals are generally able to recruit and retain higher-quality players, who tend to command higher wages and transfer fees. Greater financial resources can therefore provide a sporting advantage through the quality of playing talent a club is able to acquire and retain. The potential sporting advantage associated with spending may also depend partly on a club's expenditure relative to its competitors.
- **Effectiveness of spend:** greater spending does not guarantee success. Clubs differ in how effectively they can turn financial resources into sporting outcomes. This can reflect clubs' decisions around recruitment, coaching, tactics, squad composition and wider footballing operations. Clubs can therefore achieve different levels of sporting success despite having similar levels of player spending.
- **Luck and uncertainty:** football is an inherently uncertain sport, and luck can play a role in the success of a team. A stronger team may not always achieve the expected result, as injuries, refereeing decisions and other unpredictable events can affect performance over a season. As a result, sporting outcomes can vary in ways that cannot be explained by spending alone.

In addition, structural characteristics can influence sporting success predominantly through their effect on the level of spend, by affecting a club's ability to generate revenue and therefore the financial resources available to it. These include characteristics such as club history, fan base and geographical location. These characteristics are not necessarily direct determinants of match outcomes, but they can affect the financial resources available to a club and, therefore, its ability to invest in playing quality over time.

Existing evidence

The existing evidence indicates that greater player spending is associated with a greater likelihood of sporting success but does not guarantee it. It also indicates that the strength of this relationship may differ across leagues.

Despite the wage-allocation inefficiencies identified by Butler et al. (2024)¹, whereby differences in player wages are not fully explained by differences in sporting performance, the academic evidence supports a relationship between player spending and sporting performance. Szymanski

¹ Butler, D., Farnell, A. and Simmons, R. (2024), 'Do sports analytics affect footballer pay?', *Frontiers in Behavioral Economics*, 3, December, pp. 1–12.

(2013) shows that playing resources are the main driver of performance in the Premier League.² Measures of ‘resources’ built from transfer-fee data are highly correlated with league rank and points, indicating that richer teams systematically perform better. Crucially, resources remain the dominant factor even after controlling for team characteristics and manager effects, with models explaining a substantial share of variation in performance. This supports the view that at the aggregate level, financial resources are a key determinant of sporting success.³

Carmichael, McHale and Thomas (2011) find evidence of diminishing returns to wage expenditure, with additional spending associated with progressively smaller improvements in league performance.⁴ Taken together, the literature suggests that financial resources are an important predictor of sporting performance, but that the sporting advantage associated with additional expenditure may diminish at higher levels of spending.

The relationship between player wages and sporting success has also been recognised outside the academic literature. In the Burnley v Everton compensation proceedings, the Premier League Independent Disciplinary Commission considered whether Everton’s expenditure associated with its breach of the Profitability and Sustainability Rules (PSR) had affected sporting outcomes. The Commission observed that:

‘It is common ground that expenditure confers a sporting advantage – that is the reason that clubs spend money on players.’⁵

The Commission in Premier League v Leicester City similarly recognised that:

‘Higher squad spending by clubs increases the likelihood of sporting success, which in turn is associated with stronger commercial and financial outcomes.’⁶

Further evidence submitted by the Premier League to the IFR by Machine Football shows that in the Premier League, financial scale aligns strongly with performance. It also shows the relationship is materially weaker in the Championship. As one measure of financial scale, total wage expenditure has a Spearman rank correlation⁷ with sporting performance of 0.74 in the Premier League, compared with 0.49 in the Championship.⁸

² Szymanski, S. (2013), ‘Wages, transfers and the variation of team performance in the English Premier League’, Chapter 3, The Econometrics of Sport, Edward Elgar.

³ Oxera Consulting, ‘State of the Game literature review’, prepared on behalf of the IFR.

⁴ Carmichael, F., McHale, I. and Thomas, D. (2011), ‘Maintaining Market Position: Team Performance, Revenue and Wage Expenditure in the English Premier League?’, Bulletin of Economic Research, 63:4, October, pp. 464–497.

⁵ Burnley Football & Athletic Company Limited v Everton Football Club Company Limited (2026) PLJP 2023/3, Premier League Independent Disciplinary Commission, Decision, para. 166. Available at: <https://resources.premierleague.pulselive.com/premierleague/document/2026/06/10/14b0acd1-3d6a-41e0-a862-fffce1d6c2cc/BURNLEY-v-EVERTON-Compensation-Decision-with-Attachments-Redacted-.pdf>

⁶ On 11 November 2025, the experts produced a Joint Expert Report recording their agreement on this matter. In the matter of a Premier League Commission between the Premier League Board and Leicester City Football Club, Decision, 3 February 2026, para. 104.7. Available at:

<https://resources.premierleague.pulselive.com/premierleague/document/2026/02/05/2ca1ca85-183e-439f-9749-60ef533dd3e1/Commission-Decision-Premier-League-v-LCFC-February-2026.pdf>

⁷ Spearman’s rank correlation measures how closely the ranking of clubs by one variable corresponds to their ranking by another, ranging from -1 (strong negative relationship) to 1 (strong positive relationship).

⁸ Premier League Submission to IFR State of the Game Report, ‘Understanding performance drivers across English football’, prepared by Machine Football.

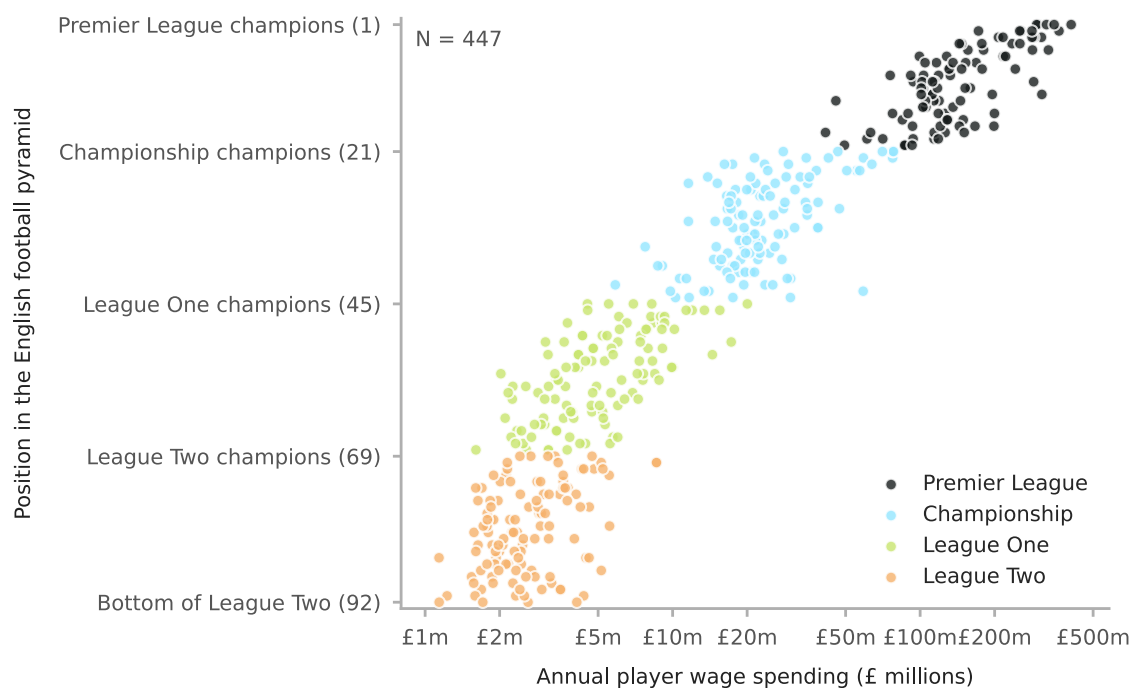
3. Data and Analytical Approach

Data

The analysis in this annex combines club financial information collected by the IFR via a formal Request for Information (RFI) to the Premier League and the English Football League (EFL)⁹, with publicly available sporting performance data. The dataset contains observations at the club-season level across the Premier League, Championship, League One and League Two for the seasons 2021/22 to 2025/26. The analysis does not include the National League because comparable player wage data were not available across the full period analysed.

Clubs that spend more on player wages tend to finish higher in their league, but spending does not fully determine sporting success.

Chart E.1: Relationship between player wage spending and league position, 2021/22 to 2025/26



Source: IFR analysis of data received from the Premier League and the EFL in response to IFR requests for information and from publicly available league table data published by the [Premier League](#) and the [EFL](#)

Note: Each dot represents a club-season and shows the association between annual player wages and final pyramid position on a logarithmic spending scale. The relationship does not imply causation. Horizontal axis shown on a logarithmic scale.

⁹ See Annex A – Financial Information for more information.

To construct measures of sporting performance, this analysis draws on publicly available league table data. League table data for the top four English divisions were collected from the Premier League and English Football League (EFL).¹⁰ This includes data on points, number of games played and final league positions.

Player wages are used as the primary measure of player spending. Sporting success is measured using two variables:

- **Final league position:** provides an ordinal measure of a club's performance relative to other clubs within the same division
- **Points per game (PPG):** provides a continuous measure of sporting performance across a season, allowing differences in performance between clubs to be captured beyond final league position

All data were cleaned and combined by the IFR, with all subsequent calculations and analysis undertaken by the IFR.

Analytical approach

The analysis is undertaken in two stages:

- **Descriptive analysis** considers the observed relationship between player wages and sporting success, including how the relationship varies across divisions
- **Econometric analysis** tests this relationship more formally using panel regression models with season fixed effects

The regression analysis uses the panel structure of the data, which contains repeated observations of clubs across seasons. Season fixed effects account for factors common to clubs in a particular season, such as changes in the wider football environment or other competition conditions. Standard errors are clustered at club level to account for the fact that observations for the same club may be related across seasons.¹¹

The analysis asks: **within each division, is higher player wage spending associated with greater sporting success, after accounting for common differences between seasons?** These common factors may include changes in player wages over time, such as wage inflation.¹² Separate models are estimated for each division to allow the strength and direction of this relationship to differ across the Premier League, Championship, League One and League Two.

The results should be interpreted as evidence of an association between player wage spending and sporting performance, rather than evidence of causation.

¹⁰ Publicly available league table data published by the [Premier League](#) and [English Football League \(EFL\)](#)

¹¹ This approach makes use of variation between clubs and over time, while avoiding the assumption that observations for the same club across different seasons are independent.

¹² For example, average player wages may be higher in 2025/26 than in 2021/22 because wages have increased across the division. Season fixed effects account for this common change, so that it is not attributed to the relationship between an individual club's wage spending and sporting performance.

4. Analysis

Player wage spending and league position

Chart E.1 provides a descriptive view of the relationship between annual player wage spending and sporting performance across the top four divisions of English football. It shows that clubs with higher player wage spending tend to finish higher in their league, although there is variation within and between leagues. This is consistent with a positive relationship between player spending and sporting success, but also shows that spending does not fully determine success.

In Chart E.1, each observation represents a club in a particular season. Final league positions are converted into a common pyramid ranking, ranging from the Premier League champion in first place to the club finishing bottom of League Two in 92nd place. There are substantial structural differences between divisions, including differences in revenues and, consequently, the level of player wages clubs can afford. These differences are also reflected in the chart by construction. For example, a Premier League club can only occupy positions 1 to 20 in the pyramid ranking. The overall relationship across the pyramid therefore partly reflects differences between divisions and should not be interpreted as a single relationship between absolute player wages and sporting performance.

Distribution of player wage spending

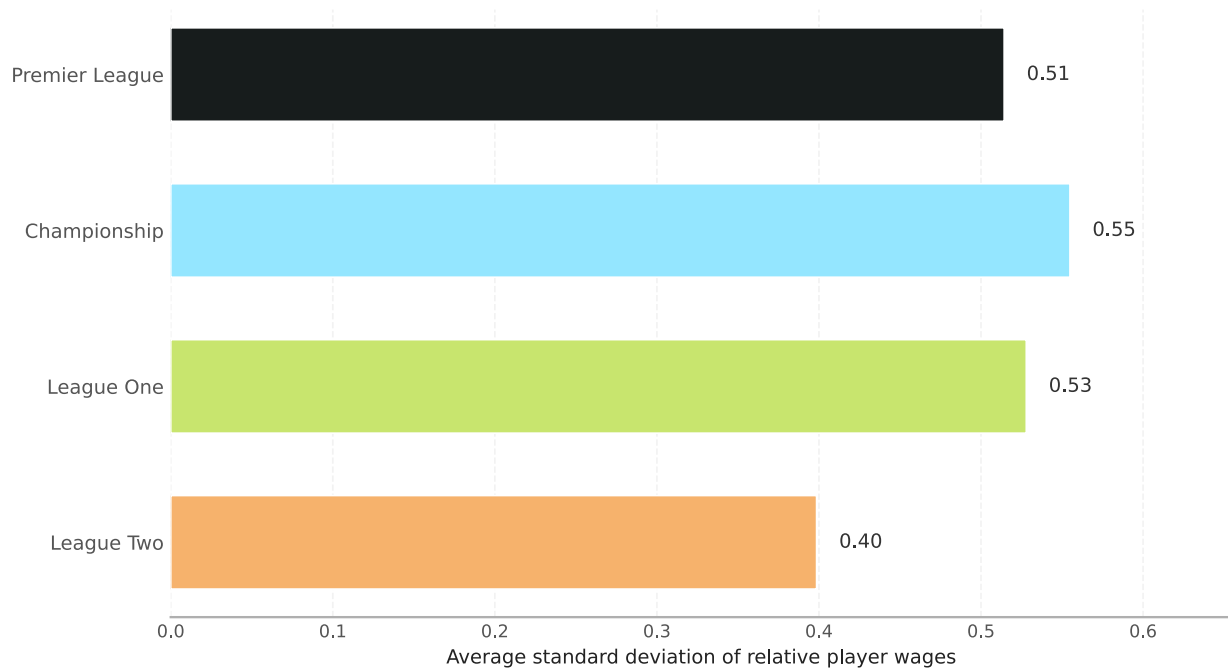
The strength of the relationship between player wages and sporting success may vary across divisions. One observable difference between divisions is the extent to which player wage spending varies between clubs. Where player wage spending is more widely dispersed, there are greater differences in spending between clubs. Conversely, where player wage spending is more concentrated, there is less variation in spending between clubs, which may make the relationship between player wages and sporting performance less apparent in the data.

Chart E.2 compares the distribution of clubs' player wage expenditure by division. Relative wages are used for this descriptive comparison to allow differences in the spread of spending to be compared across divisions with substantially different absolute wage levels. The spread of player wages is broadly similar across the Premier League, Championship and League One, but is narrower in League Two.¹³

¹³ The analysis was repeated using the average standard deviation of log player wages and the average Gini coefficient, with both measures supporting the overall pattern shown.

The spread of player wages is similar for the Premier League, Championship, and League One but is narrower in League Two.

Chart E.2: Distribution of clubs' player wage expenditure by division, average across 2021/22 to 2025/26



Source: IFR analysis of data received from the Premier League and the EFL in response to IFR requests for information.

Note: Relative player wages are calculated for each club-season by dividing the club's player wage expenditure by the mean player wage expenditure in the same division and season. The standard deviation of relative player wages is then calculated separately for each division-season. The chart reports the unweighted average of these seasonal standard deviations across the five seasons from 2021/22 to 2025/26. A higher value indicates greater proportional dispersion in player wage spending between clubs within a division.

Econometric Modelling

To assess the relationship between player wages and sporting performance more formally, we estimate regression models separately for the Premier League, Championship, League One and League Two. Points per game (PPG) is used as the main measure of sporting performance, while player wages are transformed into logarithmic form to reflect the wide range of player wage expenditure between clubs and to allow the association between additional wage expenditure and sporting performance to diminish as wage levels increase.

The specification includes season fixed effects, which account for factors common to clubs in a particular season.

The main model is expressed as:

$$PPG_{it} = \alpha + \beta \ln(Wages_{it}) + \gamma_t + \varepsilon_{it}$$

where:

- PPG_{it} is points per game for club i in season t ;
- $\ln(Wages_{it})$ is the natural logarithm of player wage spending;
- γ_t represents season fixed effects; and
- ε_{it} is the error term.

The coefficient of interest is β . It estimates the direction and strength of the association between player wage spending and sporting performance within each division, after accounting for common differences between seasons.

Final league position is used as an alternative to PPG to assess whether the results depend on the measure of sporting performance. Relative player wage spending is also considered, reflecting the relative nature of sporting competition, as the potential advantage associated with a club's spending depends partly on how that spending compares with its competitors within the same division and season. The results of these sensitivity analyses are outlined below.

Econometric Results

Table E.1 presents the estimated relationship between player wage spending and points per game across each division. The results show a positive and statistically significant association between player wages and sporting performance in all four divisions.

Under the main specification, the estimated coefficient is highest in the Premier League (0.783), followed by League One (0.557), the Championship (0.440) and League Two (0.402). All four estimates are statistically significant at the 1% level.

Overall, the results indicate a clear positive relationship between player wage spending and sporting performance across all four divisions. The estimated relationship is strongest in the Premier League and weakest in League Two.

The weaker estimated relationship in League Two is consistent with the narrower distribution of player wage spending identified in Chart E.2, which may contribute to the weaker association between spending and sporting outcomes.

Table E.1. Model results: relationship between player wage spending and sporting success

Division	Premier League	Championship	League One	League Two
Coefficient	0.783***	0.440***	0.568***	0.390***
	(0.110)	(0.053)	(0.056)	(0.081)
Club-season observations	98	117	116	116
Clubs	27	40	44	42
R-squared	0.577	0.409	0.462	0.197

Source: IFR analysis of data received from the Premier League and the EFL in response to IFR requests for information and from publicly available league table data published by the [Premier League](#) and the [EFL](#).

Note: Player wages are measured in £ millions and in natural logarithmic form. Regressions are estimated separately for each division and include season fixed effects. Standard errors clustered at club level are reported in brackets. Each division covers a total of five different seasons. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

The regression analysis was repeated using final league position rather than PPG as the measure of sporting success. The results are consistent with the main specification, with higher player wage spending associated with stronger league performance across all four divisions and all estimates statistically significant at the 1% level.

The analysis was also repeated using player wage spending relative to average wage spending in the relevant division and season. The results were consistent with the main analysis, with higher relative player wage spending associated with stronger sporting performance across all four divisions, with the estimated relationships remaining statistically significant.

Limitations

The analysis above identifies a clear positive association between player wage spending and sporting success. However, the results presented in this annex should be interpreted in the context of several important limitations, including:

- **Omitted variables:** The analysis is necessarily limited to variables that are observable and available in our dataset. While the models account for differences between seasons, they may not capture a number of potentially important club-specific factors that may influence sporting success. These include the quality of coaching, recruitment, squad composition and wider footballing operations. To the extent that these omitted factors are associated with both player wage spending and sporting success, this may give rise to omitted variable bias, meaning that the estimated relationship between player wages and sporting performance may partly reflect the influence of these factors.
- **Reverse causality:** Greater player wage spending may support stronger sporting performance, but sporting success may also increase clubs' revenues and their subsequent ability to spend on player wages. This makes it difficult to distinguish the effect of player wage spending on sporting success from the effect of sporting success on player wage spending. The analysis does not separately identify these effects.
- **Performance-related pay:** player wages may include bonuses linked to sporting outcomes, such as league position, promotion or qualification for European competitions. Where this is the case, stronger sporting performance may itself increase player wage expenditure recorded for that season. This may strengthen the observed relationship between player wage spending and sporting success.

Summary

Taken together, these limitations mean that the results should be interpreted as evidence of an association between player wage spending and sporting success, rather than evidence of causation. The estimated relationships should not be interpreted as the causal effect of increasing player wage spending on sporting success.