

**Earnings, Performance, and Nationality Discrimination in a Highly Competitive Labor
Market: An Analysis of the English Professional Soccer League^{*}**

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Abstract: This paper tests for the existence of nationality discrimination in the English professional soccer league from 1997-2002. The presence of unequal pay for equally productive workers, which is usually the definition of discrimination used by economists, has typically been identified through wage regressions that include productivity proxies and race/ethnicity indicators. The problem with this approach is that unobserved productivity characteristics may be correlated with race/ethnicity, resulting in biased estimates of discrimination. This paper utilizes a “market test” approach to determine the existence of nationality discrimination. In addition, the paper tests for the existence of consumer discrimination by estimating the effect of team nationality composition on attendance. The results suggest that players from South America may be over-represented, but this appears to be a rational response from owners who observe increased attendance with a larger presence of South American players.

Introduction

This paper examines the effect of nationality composition on team success in the English professional soccer league from 1997-2002. A “market test” approach is used to determine the existence of ethnic/nationality discrimination. In addition, the paper tests for the existence of consumer/fan discrimination by estimating the effect of team nationality composition on attendance.

Becker (1971) claimed that discrimination results from three possible sources – employer prejudice, co-worker preferences, and/or customer preferences. For the most part, in competitive profit maximizing settings, employer and co-worker prejudice should be eliminated by the market or result in the segregation of players/workers into discriminating and non-discriminating teams/employers (Becker 1971).¹ Kahn (1991a) also illustrates that segregation within teams may result from co-worker discrimination. The resistance of white players to take orders from black players, for example, can lead to the exclusion of black players from certain positions.²

Fan (customer) discrimination, on the other hand, is not eliminated by market forces. Carnibella *et al.* (1996) argue that the persistence of fan discrimination was most evident in the 1970s and 1980s with racist and ethnic chants frequently heard in the stadiums. While some of this has dissipated, there are still some signs of this behavior. Kasey Keller, an American playing for Tottenham (known for having a large Jewish following) stated that, “some rival fans still make a hissing sound, simulating gas chambers...”³ Teams that succumb to these discriminatory pressures may be rewarded through attendance, television revenues, and merchandise sales if they obtain the players the fans want to see (Kahn1991a). Accordingly,

¹ In professional basketball, Bodvarsson (1999) and Jenkins (1996) found no evidence of employer discrimination through salary differentials.

² The issue of segregation, however, is left for future research.

³ See Vecsey (2003).

these marginal revenue differences can result in long-run earnings differentials and segregation (Kahn 1991b).⁴

Research on racial and ethnic discrimination has largely focused on empirical estimates of earnings gaps, but these results may be problematic due to correlation between unobserved productivity characteristics and race/ethnicity indicators. This problem may be less severe with sports data because there are many measures of individual productivity relative to other settings. Unfortunately, for most team sports, individual player statistics are abundant for those in offensive positions, but relatively scarce for those in defensive positions. Furthermore, even for offensive players, recorded statistics do not measure all productivity attributes.⁵

Despite the shortcomings of using wage equation estimates to identify discrimination, there are few alternatives when direct individual or firm productivity measures are not available. In many professional sports settings, however, salary data can be matched to corresponding team productivity measures. With this information, the paper is able to utilize a market test approach to identify nationality discrimination in the English professional soccer league.⁶

In this approach, the teams are assumed to compete for fans in their quest to increase profits and maximize owner utility. The profit earned will be the difference between revenues, which are assumed to be a function of team success, and costs, which are assumed to depend on the cost of player talent (Szymanski 2000). In the absence of discrimination, a team's success should be primarily determined by its talent pool and, therefore, its wage expenditure.

Nationality characteristics will have a significant impact on performance, after controlling for

⁴ Evidence of consumer discrimination has been identified in basketball (Kanazawa and Funk 2001, Kahn and Sherer 1988, Hamilton 1997) and baseball (Nardinelli and Simon 1990, Anderson and La Croix 1991, Fort and Gill 2000).

⁵ For example, there are no measures that directly capture selflessness or leadership capacity.

⁶ This method has been applied by Ayres and Waldfogel (1994), Szymanski (2000), and Wilson and Ying (2003). The Szymanski (2000) paper is of particular interest because it applies the method to test for racial discrimination in English professional soccer.

salary expenditure, only if there is a discriminatory wage structure (Szymanski 2000). Teams composed of players with “non-desirable” nationality characteristics would be capable of attaining a given level of success with a lower salary bill. In other words, holding salaries constant, there would be a positive association between team success and the number of players having “non-desirable” nationality characteristics.

Institutional Setting and Theoretical Structure

The English professional soccer league is organized with several tiers through a promotion and relegation system. The highest level of competition is in the Premier League and this is followed by the Nationwide League First, Second, and Third divisions. At the end of the season, high-performing teams may earn the right to play in the division above, while low-performing teams are placed in the division below. Figure 1 illustrates the hierarchical structure and the number of teams that are promoted (or relegated) per year in each division.

[insert Figure 1]

In the English and other major European soccer leagues, there is a competitive market for players and a high degree of mobility in the labor pool.⁷ Collective bargaining agreements, salary caps, draft picks, and other market restrictions are nonexistent. Teams that acquire players who are in contract must pay an agreed-upon transfer fee to the selling team. As a result of the Bosman case in 1995, teams no longer have to pay transfer fees for players who are out of contract (Szymanski 1999). The rulings in this case also eliminated foreign player restrictions from EU countries.⁸

⁷ More than 10 percent of professional players change clubs each season (Szymanski 2000).

⁸ There is a restriction of 3 non-European players per match squad.

In addition to labor market competition between players, the density of teams results in a significant amount of competition for spectators and sponsorships. In some cases, it is possible to find more than 50 professional teams within a 100-mile radius (Szymanski 2000). Unlike most industries, teams in the English soccer league have capital that is fixed to a specific geographical location, but have a highly mobile labor force.

The Bosman rulings have resulted in an internationalized transfer market, where teams compete to get the best players possible within their budget constraints. Even here, however, some hiring bias may exist. On several occasions, leading managers (head coaches) in the English soccer league have commented on the merits of players from Scandinavia and northern Europe while emphasizing different styles of play in southern Europe and South America (McGovern 2002). These owner/manager nationality preferences may result in labor market outcomes that are more reflective of utility maximization considerations than actions driven by the typical profit motive.

Sloane (1971) was the first to formalize the idea of a hobbyist/owner deriving satisfaction from several team characteristics. In general, profits are included as one factor affecting utility. However, utility might also be affected by the atmosphere (or number of fans) in the stadium and even the racial/nationality composition of the team. In addition, profits could be positive or negative, depending on the external sources of finance (the constraint) available to the owner and their willingness to substitute profits for other benefits.

The general use of this approach could be questioned given the constraints placed on utility maximization from equity markets when teams are publicly traded. In the English league, Manchester United began publicly trading shares in 1991. Over the last three years, on average, approximately 18 teams have been traded in UK stock markets. Nevertheless, there is no

evidence indicating that clubs have changed their behavior over this time to meet the demands of shareholders (Sandy, Sloane, and Rosentraub 2004). This result, as suggested by Goddard and Sloane, may be due to the fact that individual team profit-maximization is irrelevant in a setting where leagues devise and enforce a structure intended to maximize joint profits.

Existing Literature

Given the inherent problems of low explanatory power and possible omitted variable bias in wage equation estimates of discrimination, two recent studies (Szymanski 2000; Wilson and Ying 2003), have used a different method. Szymanski's (2000) market test approach begins with the idea that in highly competitive labor markets, where most worker characteristics are observable, wages will tend to accurately reflect marginal productivities. The result, in a team-sport setting, should be that success is determined almost exclusively by the level of salary expenditure. However, holding team salary expenditure constant, a positive relationship between a particular nationality and team success implies that there is some salary discrimination against that group. In other words, teams can achieve more success by purchasing better players from the discriminated group at comparable salary levels. In a non-discriminatory setting, the number (or proportion) of players with given racial or nationality characteristics should not have a significant impact on a team's ability to win matches.

With this idea, Szymanski (2000) estimates a panel regression model of league rank on the team wage bill using data from 1978-93. The results from the basic specification indicate that 90 percent of the variation in team success can be explained by variation in salary expenditures, supporting the hypothesis that the English market for soccer players is highly competitive and may leave no room for discrimination. Results with the 1997-2002 data are

nearly identical to Szymanski's. Figure 2 shows the relationship between salary expenditure and team success using Szymanski's specification, which yields an R-squared of 0.88 with the more recent data.

[insert Figure 2]

However, Szymanski then includes some additional controls, most importantly race, and finds that even while holding wages constant there is a significant race effect. The level of discrimination also appears to be greater from 1986-93, precisely when the number of black and foreign players was increasing, with the estimates implying that teams hiring no black players would have paid a 5 percent premium on their wage bill in order to maintain their position in the league relative to a non-discriminating team.

One possible criticism of this result is that omitted determinants of team performance that are correlated with the presence of minority players may bias the results. For example, most teams perform better at home compared to away games, and it is reasonable to expect this performance to be positively affected by fan support and encouragement. Figure 3 provides some preliminary evidence of such a relationship. Some of this may be captured by team-specific effects, but attendance will also exhibit variability over time. Furthermore, Gwartney and Haworth (1974), Kahn and Sherer (1988), Burdekin and Idson (1988), and others have shown that team racial composition can have significant effects on attendance. If higher concentrations of ethnic minority players reduces attendance, and this has a negative effect on team performance, then the level of discrimination will be underestimated.

[insert Figure 3]

Wilson and Ying (2003) adopt a similar technique, but focus on post-Bosman years (1997-2000) and include data from the highest division of the top European leagues (England's

Premiership, France's Le Championnat, Germany's Bundesliga, Italy's Serie A, and Spain's Primera Division). Although Szymanski (2000) uses visual observation to determine race, Wilson and Ying (2003) use more reliable, published data on player nationality characteristics. They estimate both performance and attendance regressions. The performance regressions suggest that there is an under-representation of non-domestic talent, especially from eastern European countries and South America. In other words, teams could perform better if they hired additional players from these regions. In addition, the attendance results do not indicate that fans would respond negatively to an increase in non-domestic talent, so the authors conclude that decisions to limit the hiring of players with certain nationality backgrounds is determined by management/ownership preferences.

While the Wilson and Ying (2003) paper utilizes more reliable nationality measures, it suffers considerably from the lack of salary data. Consequently, in the performance equation, it is difficult to interpret the effect of nationality ratio because it may be picking up other team characteristics. Many of the foreign players in these soccer leagues have already shown a high level of ability in their own domestic leagues and/or have gained a significant amount of international exposure through national team matches. Without controls for team salary expenditures, the positive nationality coefficients may simply reflect the fact that the better teams are hiring the best foreign talent. Similarly, in the attendance regressions, the positive nationality coefficients may not reveal a preference for foreign talent (as claimed by the authors), but may instead reveal a desire to attend matches with higher quality players.

Despite the use of panel data, another missing element in both the performance and attendance model of Wilson and Ying (2003) is the exclusion of team fixed effects. Some teams have created loyal followings that may, in some cases, be associated with specific nationality

characteristics. Any correlation between fixed team-specific characteristics and time-varying team-nationality composition may also result in biased estimates.

The Empirical Model

The empirical methodology begins with the basic structure of Szymanski (2000) and Wilson and Ying (2003). As in both of these models, a team performance measure is used as the dependent variable. The initial specification is a random effects model of the form

$$y_{it} = \theta + \mathbf{x}_{it}\boldsymbol{\beta} + \mathbf{n}_{it}\boldsymbol{\gamma} + v_{it} \quad (1)$$

where the subscripts i and t represent a specific team and year, respectively, y is a measure of team performance, \mathbf{n} is a vector of nationality characteristics, and $v_{it} = \varepsilon_{it} + u_i + \lambda_t$ is the error term. Team performance, y_{it} , is measured by $\ln\left(\frac{p_{it}}{93 - p_{it}}\right)$, where p_{it} represents the overall league position and can vary from 1 to 92.⁹

The \mathbf{x} vector includes league division indicators, the natural log of team salary expenditure, the number of unique player appearances, and an indicator for the presence of a new team manager. The measure of salary expenditure includes the wage bill for players, coaches, trainers, and other relevant staff. It is designed to control for overall team quality and is expected to positively impact performance. As in Szymanski (2000), the number of players utilized during a season proxies for high injury rates and possibly a lack of “team chemistry” (both are likely to negatively affect performance). The new manager indicator is designed to

⁹ Szymanski (2000) also includes a similar dependent variable, which is designed to assign more weight to positions higher in the league.

control for a lack of stability in the coaching staff and is also expected to negatively affect team productivity.¹⁰ The nationality vector includes measures for the number of appearances made by eastern and southern Europeans, western and northern Europeans, Africans, South Americans, the British Isles (Republic of Ireland, Northern Ireland, Scotland, or Wales), and the residual “other” category.¹¹

Another factor to consider is the effect that attendance has on team performance. In this model, the omission may be particularly important because attendance may be correlated with player appearances for some (or all) nationalities. The specification in (1) must then be modified to address possible omitted variable bias. The team performance equation is now

$$y_{it} = \theta + \mathbf{x}_{it}\boldsymbol{\beta} + \mathbf{n}_{it}\boldsymbol{\gamma} + a_{it}\phi + v_{it} \quad (2)$$

where a measures the average home attendance (in 000s) for team i at time t . This adjustment to the model, however, is not trivial. Although attendance can affect team morale and performance, attendance is also simultaneously (within a given year or season) affected by team performance. Consequently, endogeneity issues must be addressed.

First, an attendance equation is specified. This takes the form

$$a_{it} = \mu + \mathbf{x}_{it}\boldsymbol{\varphi} + \mathbf{n}_{it}\boldsymbol{\psi} + \mathbf{z}_{it}\boldsymbol{\pi} + \tilde{v}_{it} \quad (3)$$

¹⁰ The hiring of new team managers, in nearly all instances, occurs in between seasons, so there is no reason to suspect that this variable will be simultaneously determined by team performance.

¹¹ The omitted group is English nationals.

where \mathbf{z} is a vector of instruments that includes the size of the local population (in 000s), the stadium capacity (in 000s), and the number of national team players on team i at time t . An instrumental variable (IV) approach can then be used to estimate equations (2) and (3) simultaneously. The instruments in equation (3) should have a significant impact on attendance, but should not affect team performance directly. The most suspect variable is the number of national team players. However, any impact that this has on team performance should already be accounted for by the team salary expenditure. Although team performance is included in the attendance regression, a larger number of national team players may still have a positive effect on attendance because these players tend to receive more publicity. Their popularity could induce fans to attend matches, regardless of team success.

After estimating equations (2) and (3), a Durbin-Wu-Hausman (DWH) endogeneity test can be performed and a Lagrange multiplier (LM) specification test can examine the validity of the instruments. The attendance equation estimates can also be used to identify fan discrimination. Positive coefficients in the vector $\boldsymbol{\psi}$ would indicate a net preference for foreign talent, while negative coefficients would indicate non-favorable tastes, on average, toward foreign players.

Finally, the model addresses possible correlations between ethnic player appearances and fixed effects; these may be team-specific or time-specific. The appropriate modification to equations (2) and (3) becomes

$$y_{it} = \alpha_i + \delta_t + \mathbf{x}_{it}\boldsymbol{\beta} + \mathbf{n}_{it}\boldsymbol{\gamma} + a_{it}\phi + \varepsilon_{it} \quad (4)$$

and

$$a_{it} = \tilde{\alpha}_i + \tilde{\delta}_t + \mathbf{x}_{it}\boldsymbol{\varphi} + \mathbf{n}_{it}\boldsymbol{\Psi} + \mathbf{z}_{it}\boldsymbol{\pi} + \tilde{\varepsilon}_{it} \quad (5)$$

where α_i ($\tilde{\alpha}_i$) represent team-specific effects and δ_t ($\tilde{\delta}_t$) represent year-specific effects.

Data and Descriptive Measures

The dataset includes professional soccer teams from England's Premier division along with First, Second, and Third division clubs. Table 1 contains all of the variable names and definitions. The seasons included in the data begin with the first complete post-Bosman ruling season, 1996-97, and end with the 2001-02 season. Several sources were used to compile the data. Player nationalities, appearance information, and all team performance data was acquired through *Soccerbase*, an on-line source produced by the *Mirror Group PLC* who provides soccer statistics to many media sources in England. The *Sky Sports Football Yearbooks* were utilized to obtain attendance and stadium capacity information. In addition, team addresses from this source were used to find Local Area District (LAD) population figures from *National Statistics*.¹² Finally, the *Deloitte and Touche Annual Review of Football Finance* was used for team salary expenditure information.

[insert Table 1]

In theory, the dataset might be expected to contain over 550 observations; 92 teams competing in any given season across all divisions in addition to a few teams that have been relegated to the Conference. In practice, salary expenditure data is not available across all teams for all years, but a large fraction of the participating teams from the 1996-97 to 2001-02 seasons

¹² National Statistics is the U.K. equivalent to the U.S. Census Bureau.

are represented. In total, 86 teams form the cross-sectional units with most, but not all, of their respective information available for all 6 seasons. In the end, the analysis sample contains 455 observations.

Tables 2a and 2b display the descriptive statistics for the teams in the analysis sample. The first column in these tables contain values for all teams across all sampled years. The remaining columns in Table 2a contain separate estimates for each division in the English Professional League, while the remaining columns in Table 2b contain the descriptive statistics for each sampled year.

[insert Table 2a]

[insert Table 2b]

Several patterns appear from these tables. Perhaps the most evident is the difference in salaries from Division 3 to Premier, with increases in every sampled year. In addition, as Figure 4 illustrates, the increases in salary expenditure (in absolute terms) have been largest in the Premier Division.

[insert Figure 4]

A similar pattern is present with the number of foreign-born players. As shown in Figure 5, the increased presence of foreign-born players over this time period is evident across all divisions. In general, there has been increased representation of all nationality groups from 1997-2002.¹³ The largest percent increase is for those of African origin. This group is followed by the South American, western and northern European, and eastern and southern European nationalities, respectively.

[insert Figure 5]

¹³ With the exception of players from the British Isles.

These trends cast some preliminary doubt on the premise of nationality discrimination. However, in a market that has become increasingly competitive and internationalized in the post-Bosman era, more convincing evidence is required. The presence of foreign-born players has become more common in all of the major European soccer leagues, so a more in-depth analysis of the relationship between foreign-born player appearances, salary expenditures, and team performance is necessary to identify the possible existence of discrimination. For this, we rely on the regression estimates.

Results

Table 3 presents the results from estimating equation (2). First, it is important to recognize that the results do not support the idea that attendance is endogenous in the team performance equation. The DWH test is conducted as suggested by Davidson and MacKinnon (2004) in an augmented regression. The resulting F statistic is not significant, failing to reject the null hypothesis of exogeneity. In addition, the LM tests are performed using a method outlined by Wooldridge (2002). The calculated chi-squared values, derived by $n \cdot R_\epsilon^2$ (where n is the number of observations and R_ϵ^2 is the R -squared value from regressing the errors from the performance equation on the instruments in the attendance equation) suggest that the instruments in the attendance equation are valid. Consequently, we will focus on the standard Generalized Least Squares (GLS) results in columns (1) and (3). As can be seen, the results utilizing the IV approach, reported in columns (2) and (4), are nearly identical to those in columns (1) and (3).¹⁴

[insert Table 3]

¹⁴ Bound, Jaeger, and Baker (1995) suggest that the partial F statistic on the excluded instruments in the first-stage regression should be reported and used to evaluate the quality of the instrumental variable estimates. Some of these are reported in Table 5.

The results in column (1) are from a specification that includes an explanatory variable measuring the total number of foreign-born players appearing, while the results in column (3) are from a specification that includes explanatory variables for each defined nationality group. It is also important to recall that the value of the dependent variable, in all specifications, decreases with higher league position. Therefore, variables with negative coefficients have positive effects on team performance and vice versa.

An examination of the non-nationality variables reveals a set of coefficients that are statistically significant and of the expected sign. Salaries and attendance both positively affect team performance, while the number of players utilized and the presence of a new manager negatively affect team performance.

Overall, the number of foreign-born players has no significant effect on team performance. However, when this is disaggregated into the various nationality groups, some significant effects become evident. A larger number of players from South America and the British Isles decreases team performance. Although marginally statistically significant, one additional player from the British Isles decreases the performance of the team by less than one position, on average. An additional player from South America is associated with a larger negative effect on team performance; on average, a team would fall two league positions. On the other hand, an additional player from western or northern Europe would increase a team's performance by approximately one position.

The fixed effects estimates, presented in Table 4, continue to exhibit the same pattern as the random effects estimates. Additional players from the British Isles and South America tend to be associated with negative effects, while more players from western and northern Europe positively affect team performance. However, an important revelation in these results is that

none of the nationality coefficients are statistically significant at the 5 percent level once both year and team fixed effects are included in the model. This prompted a Hausman (1978) specification test, which despite what appear to be small differences in the coefficients, suggests that the fixed effects models are more appropriate than the random effects models.¹⁵ In columns (4) and (6), the coefficient for the number of South American players is statistically significant at the 10 percent level, indicating perhaps a slight over-representation of this group in the English professional soccer league. For all other nationality groups though, we are inclined to conclude that the team productivity regressions do not show convincing evidence of nationality discrimination.

[insert Table 4]

These results might imply that fans of the English professional soccer league have no systematic preferences for players with specific nationality backgrounds. On the contrary, however, the attendance regression results in Table 5 suggest that the some nationality characteristics have substantial effects even after controlling for year and team heterogeneity. Fans appear to be significantly less attracted to attend matches when the team has more players from eastern and southern Europe, but more inclined to attend matches when the team has more players from South America. On average, an additional player from eastern and southern Europe reduces attendance from 244 to 304, and an additional player from South America increases attendance by 996 to 1,075 individuals.

[insert Table 5]

Such strong consumer preferences for South American players may explain the over-representation of this nationality as suggested by the team performance estimates. In other

¹⁵ The chi-squared values from the Hausman specification tests are statistically significant at the 5 percent level for the models that include team fixed effects and year and team fixed effects.

words, although there is some evidence indicating that increases in the number of South American players has a negative effect on a team's league position, these costly productivity effects may be outweighed by the revenue effects (increased attendance) resulting from the existing consumer preferences.

Conclusions

This paper utilizes a market test approach to obtain estimates of nationality discrimination in the English professional soccer league. A major advantage of this approach over the traditional wage equation methods is that it avoids the omitted variable bias criticism. The market test approach does not rely on the ability to measure all productive attributes, but it does assume the labor market operates efficiently. In the market for soccer players, there are many characteristics that lend support to this assertion: a large number of leagues (typically with several divisions and many teams), numerous sources of information on player productivity (including published statistics, televised matches, and a network of talent scouts), and a high degree of player mobility. In addition to these observations, the high correlation between team payroll and productivity, in both this study and Szymanski (2000), is strongly suggestive of an efficient labor market.

There are several conclusions that can be drawn from this study. One is that players from South America tend to be overrepresented in the English professional soccer league. An increased presence of these players reduces team performance, which should not occur in an efficient labor market equilibrium. However, results from the attendance equation reveal that this may be a perfectly rational reaction by owners who observe increased attendance when there

are more appearances of South American players.¹⁶ Finally, no other nationality group exerts a consistently strong impact on productivity or attendance.

Since the focus of this study is on nationality rather than race, the results are not directly comparable to Szymanski (2000). If reliable player race data becomes available, perhaps future work could simultaneously address race and nationality discrimination. There is, however, some basis for comparison with Wilson and Ying (2003) who also examine nationality preferences. Their findings suggest that players from South America and Eastern Europe are under-represented, but do not significantly affect attendance. There may be two sources responsible for the differing results. First, in this study the results apply only to the English professional soccer league, while Wilson and Ying's (2003) study includes several European leagues. Second, and more importantly, Wilson and Ying (2003) do not include a wage measure in their estimates. In a market test approach, this is the most important explanatory variable and, due to its correlation with the number of foreign players, its omission will lead to significantly biased results.

Another interesting outcome in this study is that the implied discrimination favors foreign players (South Americans), not domestic talent. According to *Deloitte and Touche*, English professional soccer teams have three primary sources of revenue: match-day/attendance (29 percent), broadcast (44 percent), and sponsorship (27 percent). The results in this study suggest that preferences for South American talent may be justified by immediate impacts on match-day revenues.¹⁷ A broader implication is that marginal revenue effects are important determinants of player (or worker) hiring decisions. While worker productivity is important, consumer demand factors cannot be ignored. Future work could perhaps address this more explicitly with empirical analyses of gate receipts, broadcast revenues, and sponsorship contracts.

¹⁶ Although the empirical model explicitly tests for fan preferences, owner and player discrimination may also exist.

¹⁷ An interesting anecdote, consistent with the results in this study, occurred in 2005 when Gabriel Heinze became the first South American player to be voted by Manchester United fans as Player of the Year.

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Figure 1

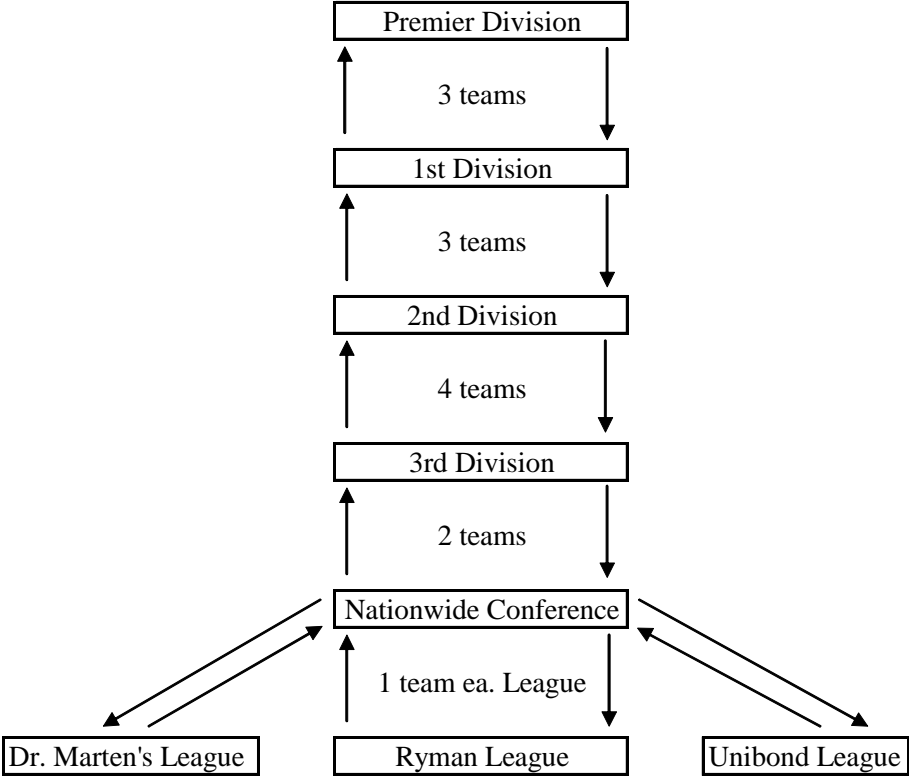


Figure 2

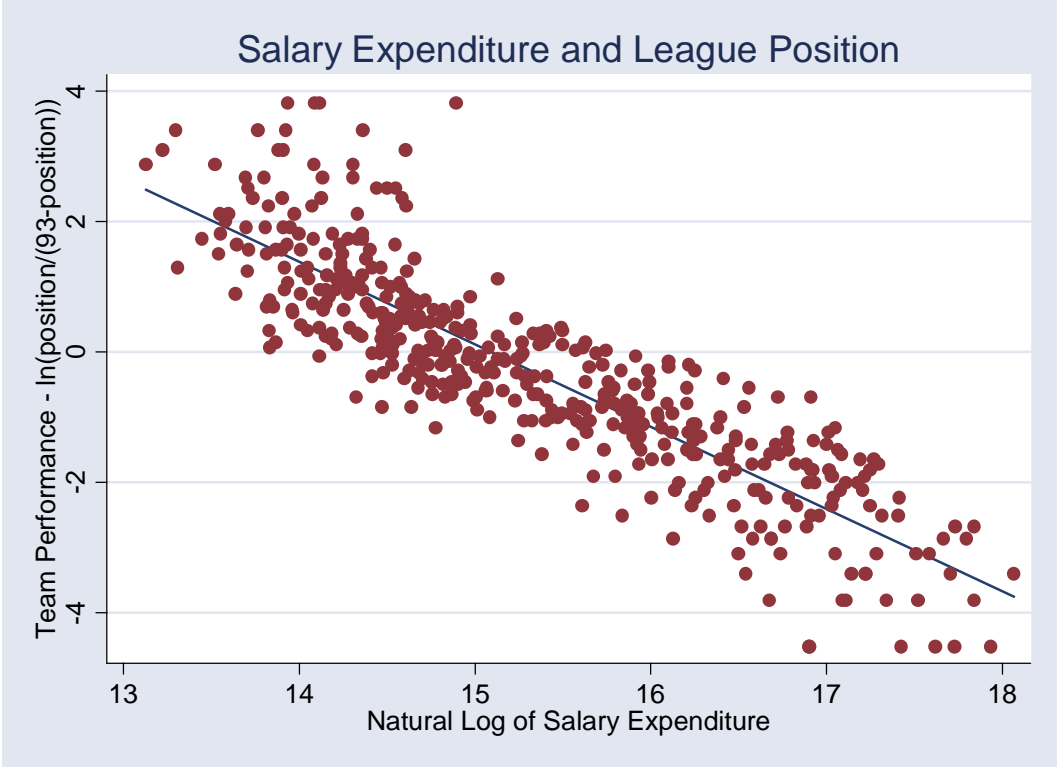


Figure 3

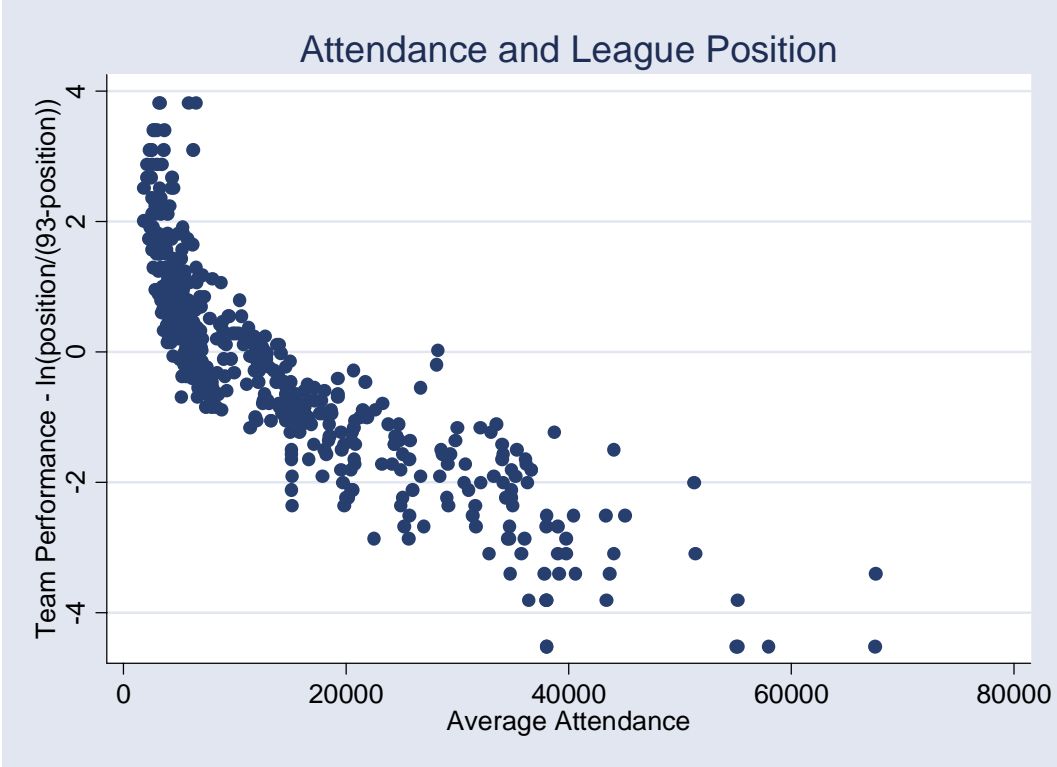


Figure 4

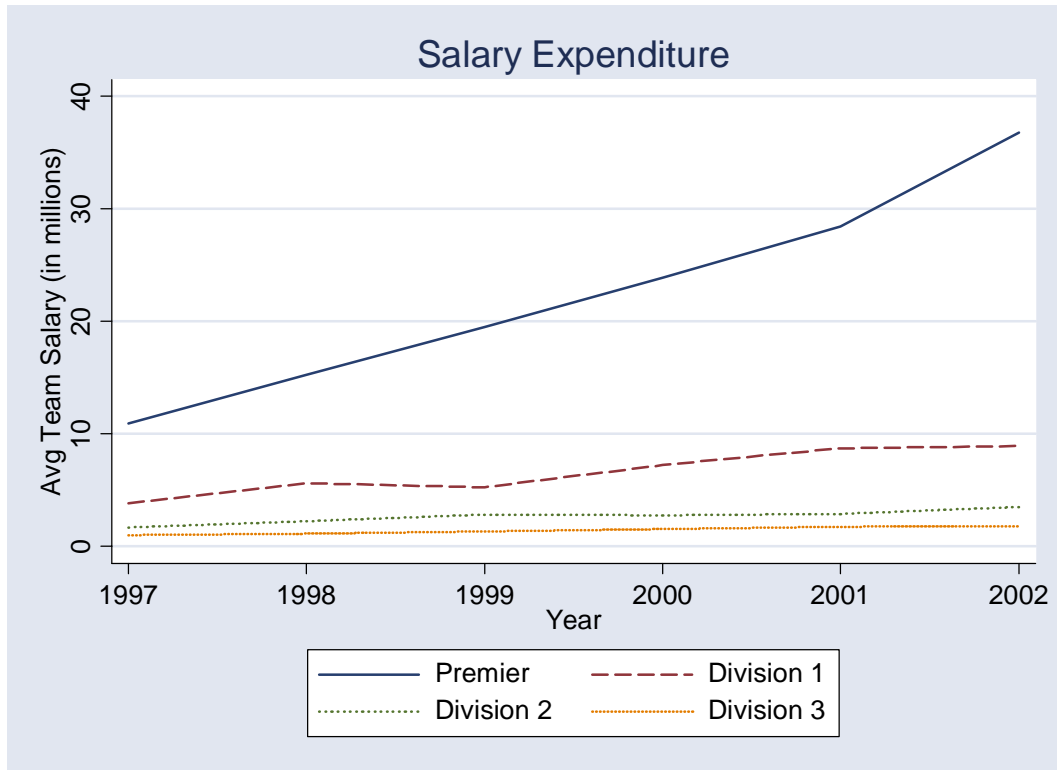


Figure 5

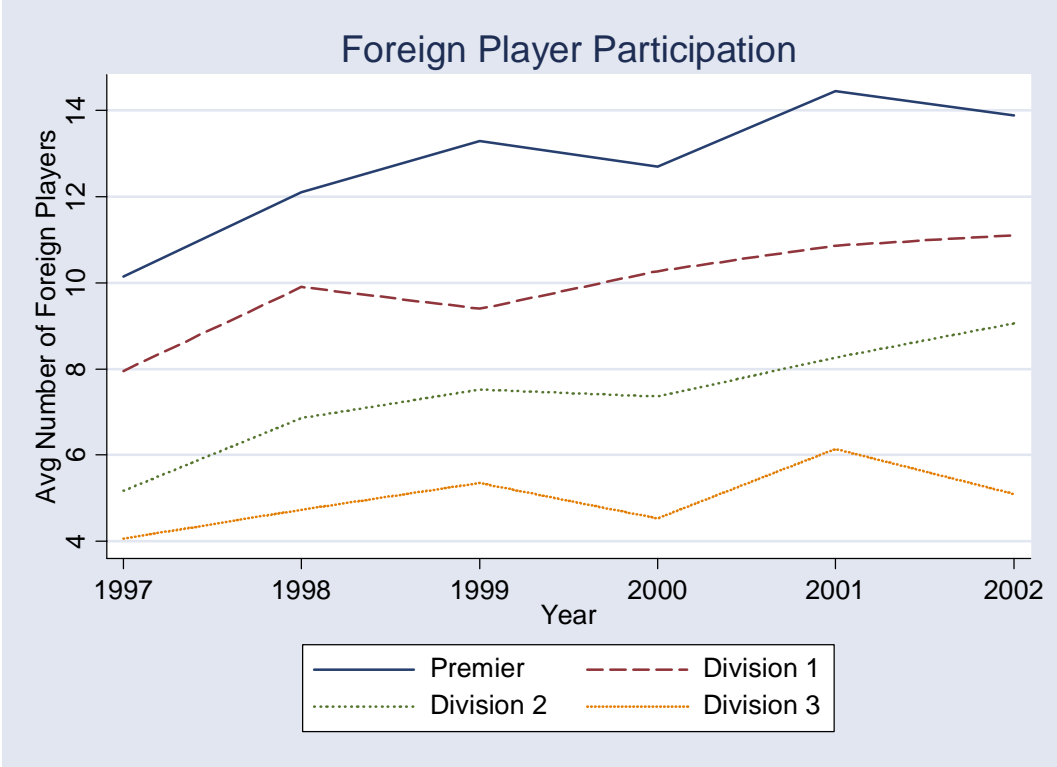


Table 1

Variable Definitions

<i>Variable Name</i>	<i>Definition</i>
position	overall team performance: $\ln(\text{position}/(93-\text{position}))$
lnsalaries	natural log of team salary expenditures
numplayers	number of unique player appearances
newmanager	1 if team manager's first season with team, 0 otherwise
avgattend	average home field attendance (in 000s)
numfb	number of foreign players
numafrican	number of African players
numeseuro	number of Eastern/Southern European players
numwneuro	number of Western/Northern European players
numsoutham	number of South American players
numisles	number of British Isles players
numother	number of players from other countries
capacity	home field stadium capacity (in 000s)
ladpop	Local Area District population (in 000s)
numnational	number of unique national team player appearances

Table 2a

Variable Means by League Division, 1997-2002

<i>Variable Name</i>	<i>All</i>	<i>Premier</i>	<i>Div 1</i>	<i>Div 2</i>	<i>Div 3</i>
position	-0.28 (1.61)	-2.32 (0.86)	-0.66 (0.34)	0.42 (0.32)	2.00 (0.78)
lnsalaries	15.32 (1.11)	16.75 (0.59)	15.50 (0.61)	14.65 (0.48)	14.07 (0.38)
numplayers	27.01 (4.23)	24.56 (2.96)	27.88 (4.46)	27.94 (4.21)	27.71 (4.13)
newmanager	0.44 (0.50)	0.34 (0.48)	0.48 (0.50)	0.48 (0.50)	0.46 (0.50)
avgattend	14.63 (12.45)	31.22 (10.84)	14.23 (6.621)	6.85 (3.45)	3.97 (1.45)
numfb	8.97 (4.79)	12.75 (3.72)	9.88 (4.17)	7.27 (3.90)	4.97 (3.73)
numafrican	0.35 (0.64)	0.59 (0.74)	0.36 (0.70)	0.28 (0.56)	0.11 (0.32)
numeseuro	0.78 (1.34)	1.93 (1.78)	0.65 (1.07)	0.22 (0.64)	0.20 (0.45)
numwneuro	2.12 (2.34)	4.27 (2.55)	2.35 (1.91)	1.03 (1.54)	0.46 (0.73)
numsoutham	0.20 (0.57)	0.55 (0.88)	0.17 (0.50)	0.05 (0.22)	0.00 (0.00)
numisles	4.60 (3.05)	4.32 (2.51)	5.17 (2.88)	4.81 (3.22)	3.85 (3.52)
numother	0.91 (1.10)	1.09 (1.14)	1.18 (1.15)	0.88 (1.14)	0.34 (0.57)
capacity	22.26 (12.58)	37.32 (11.18)	22.66 (8.36)	15.27 (5.99)	11.40 (3.86)
ladpop	244.78 (166.70)	317.16 (212.85)	269.64 (194.08)	202.89 (82.52)	170.86 (67.59)
numnational	4.6835 (5.2034)	11.4274 (4.6225)	4.2047 (3.3931)	1.6129 (1.7283)	0.6897 (1.0151)

Note – Standard deviations are in parentheses.

Table 2b

Variable Means by Year, All Divisions

<i>Variable Name</i>	<i>All</i>	<i>1997</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>
position	-0.28 (1.61)	-0.22 (1.62)	-0.25 (1.59)	-0.23 (1.62)	-0.26 (1.63)	-0.35 (1.58)	-0.41 (1.70)
lnsalaries	15.32 (1.11)	14.85 (0.95)	15.10 (1.03)	15.24 (1.07)	15.43 (1.10)	15.61 (1.14)	15.80 (1.18)
numplayers	27.01 (4.23)	25.83 (4.19)	27.08 (4.12)	27.22 (4.32)	27.13 (4.10)	27.77 (3.94)	27.16 (4.62)
newmanager	0.44 (0.50)	0.48 (0.50)	0.42 (0.50)	0.42 (0.50)	0.39 (0.49)	0.45 (0.50)	0.48 (0.50)
avgattend	14.63 (12.45)	12.78 (11.14)	14.06 (11.94)	14.41 (12.28)	14.50 (12.11)	15.27 (13.31)	17.33 (16.12)
numfb	8.97 (4.79)	6.95 (3.96)	8.57 (4.65)	9.01 (4.84)	8.99 (4.72)	10.28 (4.88)	10.41 (5.01)
numafrican	0.35 (0.64)	0.15 (0.45)	0.22 (0.48)	0.31 (0.54)	0.34 (0.71)	0.55 (0.74)	0.61 (0.77)
numeseuro	0.78 (1.34)	0.55 (1.04)	0.78 (1.37)	0.77 (1.31)	0.77 (1.40)	0.88 (1.48)	0.95 (1.41)
numwneuro	2.12 (2.34)	1.22 (1.51)	1.64 (2.04)	2.15 (2.48)	2.43 (2.34)	2.71 (2.51)	2.77 (2.74)
numsoutham	0.20 (0.57)	0.09 (0.39)	0.12 (0.51)	0.18 (0.45)	0.23 (0.58)	0.29 (0.73)	0.33 (0.69)
numisles	4.60 (3.05)	4.18 (2.69)	4.90 (3.31)	4.79 (3.27)	4.30 (2.88)	4.80 (3.11)	4.69 (3.03)
numother	0.91 (1.10)	0.77 (0.96)	0.92 (1.19)	0.81 (1.05)	0.91 (1.09)	1.05 (1.14)	1.06 (1.17)
capacity	22.26 (12.58)	21.56 (12.51)	21.98 (12.96)	22.15 (12.59)	22.31 (12.43)	22.52 (12.56)	23.30 (13.14)
ladpop	244.78 (166.70)	239.22 (163.85)	241.71 (167.20)	241.32 (165.47)	244.91 (164.82)	250.81 (168.20)	252.61 (177.53)
numnational	4.68 (5.20)	3.18 (3.52)	4.01 (4.38)	4.41 (4.82)	4.80 (5.26)	5.53 (5.95)	6.61 (6.59)

Note – Standard deviations are in parentheses.

Table 3

Random Effects Model Estimates

<i>Exp Var</i>	(1)	(2)	(3)	(4)
lnsalaries	-0.1918 (0.0595)	-0.1478 (0.0669)	-0.1664 (0.0600)	-0.1318 (0.0660)
numplayers	0.0441 (0.0061)	0.0433 (0.0061)	0.0420 (0.0060)	0.0418 (0.0061)
newmanager	0.1331 (0.0429)	0.1332 (0.0435)	0.1501 (0.0431)	0.1546 (0.0440)
avgattend	-0.0371 (0.0052)	-0.0440 (0.0066)	-0.0379 (0.0050)	-0.0427 (0.0061)
numfb	0.0053 (0.0075)	0.0052 (0.0074)		
numafrican			0.0423 (0.0353)	0.0319 (0.0356)
numeseuro			0.0134 (0.0221)	0.0093 (0.0219)
numwneuro			-0.0356 (0.0138)	-0.0386 (0.0137)
numsoutham			0.0862 (0.0466)	0.0916 (0.0466)
numisles			0.0153 (0.0088)	0.0162 (0.0085)
numother			-0.0043 (0.0218)	-0.0028 (0.0216)
<i>R</i> -sq	0.9223		0.9263	
IV	no	yes	no	yes
Durbin-Wu-Hausman <i>F</i>		2.66		2.02
LM Spec chi-sq		7.37		3.82

Note – Standard errors are in parentheses. All regressions also include a set of division dummies.

Table 4

Fixed Effects Model Estimates

<i>Exp Var</i>	(1)	(2)	(3)	(4)	(5)	(6)
lnsalaries	-0.3928 (0.0761)	-0.3649 (0.0742)	-0.1283 (0.0703)	-0.1122 (0.0731)	-0.3448 (0.1069)	-0.3290 (0.1079)
numplayers	0.0428 (0.0060)	0.0406 (0.0060)	0.0443 (0.0067)	0.0421 (0.0068)	0.0430 (0.0067)	0.0403 (0.0068)
newmanager	0.1542 (0.0427)	0.1720 (0.0429)	0.1212 (0.0448)	0.1303 (0.0448)	0.1363 (0.0453)	0.1468 (0.0454)
avgattend	-0.0294 (0.0055)	-0.0296 (0.0053)	-0.0189 (0.0100)	-0.0248 (0.0103)	-0.0189 (0.0101)	-0.0242 (0.0104)
numfb	0.0061 (0.0074)		0.0031 (0.0091)		0.0040 (0.0091)	
numafrican		0.0209 (0.0351)		0.0496 (0.0380)		0.0418 (0.0381)
numeseuro		0.0237 (0.0219)		0.0228 (0.0260)		0.0288 (0.0260)
numwneuro		-0.0394 (0.0137)		-0.0239 (0.0159)		-0.0249 (0.0159)
numsoutham		0.0701 (0.0460)		0.0988 (0.0543)		0.0920 (0.0541)
numisles		0.0178 (0.0087)		0.0051 (0.0120)		0.0084 (0.0121)
numother		-0.0029 (0.0215)		-0.0096 (0.0253)		-0.0132 (0.0252)
<i>R</i> -squared	0.9251	0.9298	0.9141	0.9190	0.9225	0.9260
Year Effects	yes	yes	no	no	yes	yes
Team Effects	no	no	yes	yes	yes	yes
Hausman chi-sq	14.55	16.56	26.61	54.73	25.30	39.62

Note – Standard errors are in parentheses. All regressions also include a set of division dummies.

Table 5

Attendance Equation Estimates

<i>Exp Var</i>	(1)	(2)	(3)	(4)
lnsalaries	2.5260 (0.3620)	2.9644 (0.4994)	2.8484 (0.3822)	3.0937 (0.5689)
numplayers	-0.0770 (0.0329)	-0.0726 (0.0328)	-0.0966 (0.0340)	-0.0929 (0.0340)
newmanager	-0.5205 (0.2255)	-0.5685 (0.2266)	-0.4367 (0.2275)	-0.4718 (0.2299)
numafrican	0.1520 (0.1907)	0.1529 (0.1904)	0.1458 (0.1915)	0.1344 (0.1915)
numeseuro	-0.2676 (0.1272)	-0.3035 (0.1266)	-0.2443 (0.1329)	-0.2747 (0.1322)
numwneuro	-0.1357 (0.0798)	-0.1112 (0.0799)	-0.1556 (0.0813)	-0.1357 (0.0815)
numsoutham	0.9959 (0.2629)	1.0475 (0.2607)	1.0376 (0.2712)	1.0746 (0.2694)
numisles	-0.0974 (0.0565)	-0.1068 (0.0564)	-0.0233 (0.0630)	-0.0373 (0.0631)
numother	-0.1057 (0.1249)	-0.0979 (0.1239)	-0.0671 (0.1300)	-0.0641 (0.1297)
capacity	0.5098 (0.0315)	0.4922 (0.0343)	0.2414 (0.0720)	0.2405 (0.0716)
ladpop	0.0009 (0.0020)	0.0010 (0.0020)	-0.0172 (0.0336)	-0.0206 (0.0340)
numnational	0.1928 (0.0649)	0.1716 (0.0652)	0.1287 (0.0691)	0.1139 (0.0696)
<i>R</i> -squared	0.9347	0.9351	0.7945	0.7503
Partial <i>F</i>	107.80	80.71	5.12	4.87
Year Effects	no	yes	no	yes
Team Effects	no	no	yes	yes

Note – Standard errors are in parentheses. All regressions also include a set of division dummies. The reported partial *F* statistics are used to test the null hypothesis that the coefficients for the instruments are simultaneously zero; in all cases, the null hypothesis is rejected at the 0.05 level of significance.