

A Market Test for Discrimination in the English Professional Soccer Leagues

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This paper proposes a market test for racial discrimination in salary setting in English league soccer over the period 1978–93 using a balanced panel of 39 clubs. If there is a competitive market for the services of players, the wage bill of the club will reflect their productivity and hence the performance of the club in the league. Discrimination can be said to exist if clubs fielding an above-average proportion of black players systematically outperform clubs with a below-average proportion of black players, after one controls for the wage bill. Statistically significant evidence of discrimination in this sense is found.

I. Introduction

Statistical testing for the presence of racial discrimination remains one of the most controversial fields in economics. Discrimination in the sense of unequal pay for equal work is conventionally identified through the construction of an earnings function. This relates personal characteristics that influence productivity to earnings so that any residual differences in the earnings of two groups can be attributed to discrimination. A fundamental criticism of this test is that omitted-variable bias may have created a mistaken impression of discrimination. If unobserved characteristics that affect productivity are

I am indebted to Michael Crick, Izzet Agoren, Lamin Sabally, Tim Kuypers, and Andrew Craven for their help in compiling the data set used in this paper. I have benefited considerably from the advice of Ron Smith, Steve Machin, and Ian Preston. I would like to thank seminar participants at Imperial College and University College London and an anonymous referee for helpful comments.

correlated with group membership, it will appear that one group suffers discrimination when in fact it has systematically lower productivity (see, e.g., Heckman 1998).

This paper proposes an alternative, a “market test.” There is evidence of discrimination in the market when some firms can earn systematically higher monetary profits by hiring an above-average proportion of one group of workers. An employer with a “taste for discrimination” will have a lower demand for otherwise identical workers who possess the relevant attribute (the approach here is essentially that of Becker [1957]). If there are enough employers with a taste for discrimination, workers with this attribute will attract a lower market wage rate. Employers with a greater taste for discrimination will earn lower monetary profits than their less discriminating rivals. Lower monetary profits are compensated by higher “psychic” profits. Arrow (1973, 1998) argued that this kind of discrimination would be competed away by the market since profit maximizers will compete to obtain the services of the underpriced factor and will drive the discriminators out of the market. This is a testable hypothesis.

This paper implements a test in the market for professional soccer players in England.¹ Soccer (association football) is the “national game” in England, and spectator interest focuses on annual league competition between established clubs. Clubs are businesses owned by shareholders and file annual accounts open to public inspection. Clubs generate income primarily from ticket sales and incur costs primarily associated with the player payroll. There is a highly competitive market for players, who are traded openly for cash. Since the early 1970s there has been a significant influx of black players into English soccer. Racial discrimination and harassment are well-documented problems in English soccer (see, e.g., Williams 1994). It has been suggested that certain clubs have at different times operated a color bar, and prejudice is believed to be widespread.² Nevertheless, black players now account for a significant minority (around 10 percent) of all players in the professional leagues.

Using a database of 39 clubs over the years 1978–93, I examine the performance of clubs on the basis of payroll costs and the pro-

¹ Ayres and Waldfogel (1994) applied a version of the market test to the case of bail setting in Connecticut.

² The owner of one leading team notoriously commented that “the problem with black players is they’ve great pace, great athletes, love to play with the ball in front of them . . . when it’s behind them it’s chaos. I don’t think too many of them can read the game. When you’re getting into the midwinter you need a few of the hard white men to carry the athletic black players through” (quoted in the *Sunday Times*, September 15, 1991).

portion of all black players in league soccer employed at each club. The econometric results show that teams with a below-average proportion of black players have tended to achieve inferior playing performance compared to other teams, suggesting that discrimination both exists among club owners and has not been competed away by the market.

Section II outlines the structure of English soccer and the market for players. Section III presents a simple model of discrimination, and Section IV analyzes the presence of black players in English soccer. Section V describes the data, testing, and results. Section VI discusses some robustness issues and draws some conclusions.

II. Professional English Soccer and the Market for Players

The economics of English league soccer bear some resemblance to the economics of team sports in the United States, a subject on which there is an extensive literature (see, e.g., the review of Fort and Quirk [1995]). From the point of view of this article, there are three salient features of professional league soccer in England.³

i) League competition is hierarchical, with four divisions each containing around 20 teams. At the end of each season the highest-ranked teams from a lower division swap places with the worst-performing teams from the immediately senior division. There are no play-offs, and hence competition is focused simply on league ranking.⁴ Redistribution of income is limited, and other measures to maintain competitive balance (e.g., draft picks or salary caps) are not used.⁵

ii) There is a free market for players. Players are frequently traded between clubs, with more than 10 percent of professionals changing clubs each season. Effective freedom of contract dates from 1978.⁶

³ Szymanski and Kuypers (1999) provide a historical overview, and Hoehn and Szymanski (1999) survey the main differences between the organization of soccer in Europe and that of American team sports.

⁴ The top division seceded from the Football League in 1993 and renamed itself the Premier League but retained the promotion/relegation relationship with the Football League. Clubs also compete in knockout cup competitions, which are organized independently, including European-wide cups; however, clubs play most of their games in domestic league competition.

⁵ Until 1982, up to 20 percent of gate receipts were shared with the visiting team. Television revenue has traditionally been shared, but the sums involved did not become significant until 1993.

⁶ A settlement was agreed between the players' union and the league representing the clubs. As part of the settlement, a buying club was still obliged to pay a fee to the selling club proportional to the perceived market value of the player (settled by a tribunal in the case of disputes). In 1995, transfer fees for players out of contract were abolished following the Bosman judgment of the European Court of Justice (see Szymanski 1999).

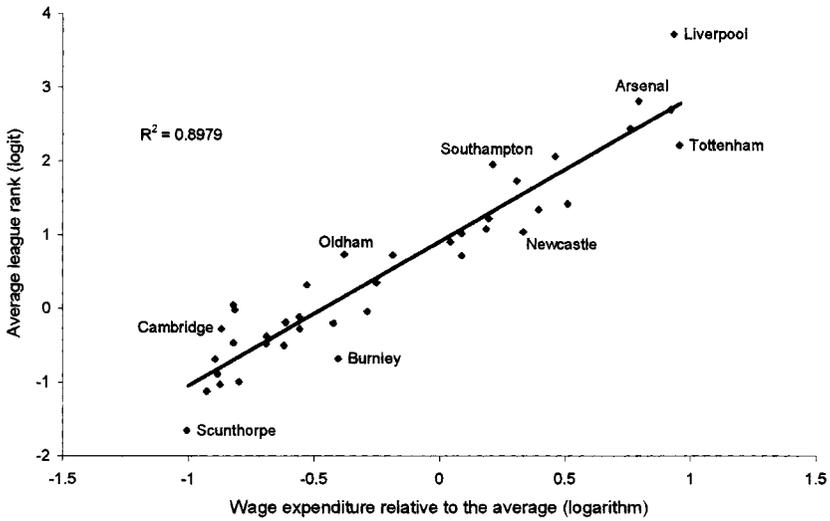


FIG. 1.—Performance and club wage bill, 1978–93

There is no collective bargaining over player salaries, and there are no salary cap restrictions.

iii) The density of clubs in the United Kingdom is high, leading to greater competition among clubs for spectators and sponsorship than in the United States. For example, within 100 miles of Manchester United, currently the most popular club in the country, there are around 50 other professional soccer clubs participating in league competition.

If both player and fan markets are competitive, players will earn wages that reflect their talents, and club expenditure on players will be a fairly reliable indicator of talent. The data suggest that the English market is quite competitive. A simple regression of league rank on the club wage bill produces an R^2 of about .9. This relationship is illustrated in figure 1 for my sample of 39 clubs averaged over the years 1978–93.

III. A Model of Discrimination in Sports Leagues

Suppose that team owners maximize a utility function⁷ that is a weighted average of profits (π) and the share of white players (s) in

⁷ There has been much discussion of the appropriate objective function for sports clubs in the literature. See, e.g., Fort and Quirk (1995) and Vrooman (1997) for the U.S. view and Sloane (1971) and Cairns, Jennett, and Sloane (1986) for U.K. views.

the team (reflecting a taste for discrimination). Thus the objective function for team i is given by

$$\Omega_i = \alpha s_i + (1 - \alpha)\pi_i. \quad (1)$$

The most important feature of (1) is that the owners are assumed to have a taste for discrimination represented by the proportion of “white” playing talent (t_w) in the team (discrimination is assumed to be based on the perception that a player is either black or white):

$$s_i = \frac{t_{iw}}{t_{iw} + t_{ib}}. \quad (2)$$

The taste for discrimination is defined in terms of talent rather than simply the numbers of players. Since the credit for winning is usually ascribed in proportion to the talent of the players, it is assumed that the discriminator aims to ascribe success to white playing talent.⁸

Profit depends on revenues, which are a function of playing success, and costs, which depend on the cost of playing talent:

$$\pi_i = R_i(w_i(T_i)) - c_i(s_i)T_i. \quad (3)$$

Sporting success (w) could be measured by the percentage of wins, championship success, or, as is usually the case in league soccer, league position. Sporting success in turn depends on the quantity of sporting talent hired by the club: $T_i \equiv t_{iw} + t_{ib}$. In line with much of the earlier literature (see, e.g., El-Hodiri and Quirk 1971; Atkinson, Stanley, and Tschirhart 1988), it is assumed that while talent differs according to the functions of the players, it can be aggregated across specializations and treated as a homogeneous input. Talent is not differentiated by race or color, and no assumption is made about the actual distribution of talent between blacks and whites. I assume that revenue as a function of winning and winning as a function of talent are both strictly concave functions.

Costs are affected by a discriminatory policy. The cost of hiring a given quantity of talent will generally be greater if the owner requires that the talent hired possesses an additional characteristic. For a given intensity of discrimination (α), talent is assumed to be supplied at a constant marginal cost. The marginal cost of talent to a club depends on its owners' taste for discrimination:

$$c_i(s_i) = \begin{cases} c_{i0}[1 + (s_i - s^*)^2] & \text{if } s_i > s^* \\ c_{i0} & \text{if } s_i \leq s^*, \end{cases} \quad (4)$$

⁸ I ignore the possibility that some owners might have a taste for discrimination in favor of black players.

where s^* represents the proportion of white players employed in the team beyond which the club begins to pay a premium for white talent. The value of s^* will be determined endogenously by the supply of and demand for black and white talent in the market. Owners who discriminate by hiring exclusively or predominantly white playing talent pay a premium because they are restricting themselves to a subset of the market. Discriminators also drive down the cost of playing talent to nondiscriminators, who acquire a degree of monopsony power. If there is discrimination, s^* will be at least as great as the proportion of white players in the market. Owners may be able to discriminate to a limited degree without paying a premium. For example, if there are only a small number of professional black players, discriminating owners face virtually the same supply of talent as nondiscriminators. However, once the supply of black talent forms a significant part of the market, discriminators will pay a premium for restricting their choice.⁹ Using (1)–(4), we can derive first-order conditions for firm i :

$$t_{iw} \cdot \alpha \frac{\partial s_i}{\partial t_{iw}} + (1 - \alpha) \left(\frac{\partial R_i}{\partial w_i} \frac{\partial w_i}{\partial t_{iw}} - c'_i \frac{\partial s_i}{\partial t_{iw}} T_i - c_i \frac{\partial T_i}{\partial t_{iw}} \right) = 0 \quad (5)$$

and

$$t_{ib} \cdot \alpha \frac{\partial s_i}{\partial t_{ib}} + (1 - \alpha) \left(\frac{\partial R_i}{\partial w_i} \frac{\partial w_i}{\partial t_{ib}} - c'_i \frac{\partial s_i}{\partial t_{ib}} T_i - c_i \frac{\partial T_i}{\partial t_{ib}} \right) = 0. \quad (6)$$

When we subtract (6) from (5), noting that

$$\frac{\partial s_i}{\partial t_{iw}} - \frac{\partial s_i}{\partial t_{ib}} = \frac{1}{T},$$

the solution for a discriminating owner ($\alpha > 0$) implies

$$t_{iw} = s^* T + \frac{\alpha}{2(1 - \alpha) c_{i0}}. \quad (7)$$

In the absence of a taste for discrimination ($\alpha = 0$), the share of white playing talent in the team is indeterminate but will be no more than s^* (roughly the share of white players in the total talent repre-

⁹ The specification of (4) does not allow for the possibility that there would be a cost to discriminating against white players, since such behavior is not modeled here. If two-way discrimination did occur (i.e., some owners discriminating in favor of white players and some owners discriminating against), then there would be a tendency toward segregation and the wage differential created by one-way discrimination would be reduced.

sented in the league). When an owner discriminates, the share of white playing talent in the team will become significantly greater than its share in the population as a whole. But this also implies that a discriminating owner will pay a higher price per unit of talent hired.

The implication of the model is that a taste for discrimination acts like a tax on the success of the team.¹⁰ Thus the expected performance (measured by league position) for a given level of expenditure will be worse for teams owned by discriminators than for teams owned by nondiscriminators. This difference in expected performance should be detectable in a regression of performance on wage expenditure. If discrimination is the reason that some clubs hire a relatively low proportion of black players, then these clubs will have a significantly higher cost per unit of playing success than the norm. If the distribution of black players were purely random, then the expected performance of a club, after one controls for wage expenditure, would be unaffected by the color composition of the team.

IV. Black Players in English Soccer

The first black people to come to England were probably soldiers in the army of Julius Caesar, long before the “indigenous” Anglo-Saxon population arrived. However, the black population in England did not become a significant proportion of the total population until the 1950s. Around that time, immigrants were invited into the country by successive governments because of chronic labor shortages. Immigrants came mostly from South Asia (India, Pakistan, Bangladesh, and Sri Lanka) and the Caribbean, with lesser numbers of Chinese and black Africans. According to the 1991 official census, around 900,000 people living in the United Kingdom describe themselves as black, about 1.6 percent of the total population.

By the 1970s there were a significant number of black professional soccer players in England. Data on black players appearing for the 39 league clubs in my sample (from a population of 92) were constructed by a painstaking analysis of player records for the period 1974–93. In 1974 there were only four black players appearing a total of 77 times for the sample clubs, whereas by 1993 there were 98 players appearing 2,033 times. Given an average squad size of

¹⁰ It has sometimes been argued that club owners maximize playing success subject to a budget constraint. It should be clear that while this formulation might yield different levels of success and profit, the implication of an increased taste for discrimination would be qualitatively the same.

TABLE 1
PLAYING CAREERS

	PLAYERS BORN 1957-74		PLAYERS BORN 1957-74 WITH 20 OR MORE LEAGUE APPEARANCES	
	Black (1)	Nonblack (2)	Black (3)	Nonblack (4)
Sample size	193	193	166	115
Year born	1964.7	1964.7	1964.0	1964.3
Percentage born:				
Overseas	.114	.047	.108	.026
In the North	.223	.539	.222	.609
In the Midlands	.207	.150	.204	.130
In the South	.464	.264	.476	.235
Year playing career started	1983.7	1983.8	1983.0	1983.3
Last year of playing career	1990.0	1987.7	1990.2	1989.1
Career length (years)	6.3	3.9	7.1	5.8
Number of clubs represented	3.0	2.1	3.3	2.7
League appearances	147.6	95.4	170.6	154.8
Goals scored during playing career	25.1	11.8	29.0	19.4
Percentage who represented their country	.358	.228	.386	.293
Percentage playing in defense	.265	.321	.271	.362
Percentage playing in midfield	.150	.264	.133	.241
Percentage playing in attack	.585	.332	.596	.328
Percentage goalkeepers	.000	.078	.000	.069

SOURCE.—Hugman (1992).

around 30 players, by 1993 about 8 percent of all players were black. The distribution of appearances indicates marked differences between individual clubs. The lowest number of appearances (i.e., matches played by black players) for any club in the data over the entire sample period is two. Two clubs in the sample had fewer than 10 appearances by black players, and four had fewer than 100. Four clubs registered more than 1,000 appearances by black players.

To analyze player characteristics, a matching stratified sample of nonblack players was assembled in which each stratum contained the same number of players with a given birth year as the black players (salary data are not available). Table 1 reports the mean values for selected characteristics. Columns 1 and 2 show the means for the entire sample, and columns 3 and 4 give the mean values for the players who made at least 20 league appearances in their career.¹¹ Black players enjoy greater playing longevity than nonblack

¹¹ This adjustment is made to ensure that the results do not simply reflect missing observations for black players who appeared on only a small number of occasions.

players: they play for more years and have more league appearances. The differences are all statistically significant at the 5 percent level. Black players are more likely to play in attack and less likely to play in defense than nonblack players. Perhaps as a consequence they score more goals. There were no black goalkeepers in the sample.¹² Black players are more likely to represent their country (be it England or another country), an achievement that is generally associated with a higher level of playing ability. It is tempting to surmise from the table that black players possess higher ability and greater “staying power” than the average player.

V. A Market Test of Discrimination

Given a competitive market for players, it will be possible to detect any systematic discrimination against subgroups of professional players. Discrimination will imply that players in the subgroup command a lower market wage for their talents, and therefore teams containing an above- (below-) average proportion of such players will over- (under-) perform relative to the average. Performance is measured here by position achieved in the league, which is usually taken to be the ultimate yardstick of quality.¹³ The regression model takes the following form:

$$p_{it} = \alpha_i + \sum_{j=1}^3 \beta_j \text{div}_{jit} + \beta_4 (w_{it} - \bar{w}_t) + \beta_5 (\text{play}_{it} - \overline{\text{play}}_t) + \beta_6 (\text{black}_{it} - \overline{\text{black}}_t). \quad (8)$$

This specification follows the earlier work of Szymanski and Smith (1997). The term p is position transformed into the log odds of position,¹⁴ which gives a higher weight to progress further up the league. Aggregate wages are measured as the log difference of club wage spend to the annual average ($w_{it} - \bar{w}_t$), taken from published club accounts. The aggregate number of players used in a season relative to the average ($\text{play}_{it} - \overline{\text{play}}_t$) is also included since a rapid turnover of players is unsettling for team performance. Turnover usually reflects a high level of injuries sustained (“bad luck,” in other words).

¹² A number of studies, summarized by Kahn (1991), have found significant positional bias for black players in American baseball and football.

¹³ In English soccer, at least. League position depends on the outcome of over 40 matches over an eight-month period and therefore is likely to be a much better indicator of performance than success in cup competitions, which is significantly affected by chance events such as the luck of the draw.

¹⁴ This is $\ln[p/(93 - p)]$ since there are a total of 92 professional teams in the four interlocking divisions.

TABLE 2

REGRESSION ESTIMATES: FIRST DIFFERENCES WITH INSTRUMENTAL VARIABLES

Dependent Variable: Log Odds of Position

	39 CLUBS			19 LARGEST CLUBS,	20 SMALLEST CLUBS,
	1978-93	1978-85	1986-93	1978-93	1978-93
	(1)	(2)	(3)	(4)	(5)
Observations	624	312	312	304	320
Relative wage bill	-.535 (.169)	-.691 (.201)	-.557 (.236)	-.632 (.336)	-.368 (.172)
Number of players used	2.067 (.190)	1.704 (.213)	2.323 (.331)	2.257 (.306)	1.885 (.205)
Share of black players employed	-.026 (.011)	-.014 (.010)	-.136 (.049)	-.101 (.052)	-.008 (.007)
<i>p</i> -value for black player coefficient	.021	.166	.005	.049	.247

NOTE.—Robust one-step standard errors are in parentheses. The two-step procedure was inappropriate since the number of groups is relatively small. The reset test for nonlinearity is insignificant in all cases. Some evidence of nonnormality was found as a result of excessive kurtosis, probably caused by outliers in the data. Wu-Hausman tests indicated that all variables were predetermined. Note that the entire data set runs from 1974 to 1993, but only the years from 1978 onward are of interest since this is the date at which free agency was introduced. This means that when one is constructing first differences, no degrees of freedom are lost since the pre-1978 data can be used.

Finally, the presence of black players in each club is measured by the percentage of total appearances by black players each season (for the sample clubs) accounted for by each club ($black_{it} - \bar{black}_t$).¹⁵

Club-specific attributes that may affect performance (e.g., culture, geography, and demographics) are accounted for by fixed effects (α_i). They are eliminated in the regression by first-differencing.¹⁶ Divisional dummies (div_{it}) control for the fact that clubs are constrained by their divisional status within each season even though they can move divisions across seasons.¹⁷ The main results are reported in table 2. Column 1 pertains to the full sample of 39 clubs over the 16 years since the establishment of free agency. Column 2 uses a subsample from the first eight years and column 3 for the last eight years. Column 4 is based on a subsample of the 19 largest clubs in terms of average ground capacity over the sample period, and column 5 reports the estimates for the 20 smallest clubs.

Wages and the number of players used both have the right sign

¹⁵ Other variables considered for inclusion in the regression are discussed in Sec. VI.

¹⁶ The regressions were estimated using the DPD98 program of Arellano and Bond (1998).

¹⁷ These dummies are not reported here. The full regression results are available from the author on request.

and are highly significant.¹⁸ Wu-Hausman tests (using lagged wages and performance as instruments) indicated that weak exogeneity of the wage variable cannot be rejected (for col. 1, $t = -1.21$). Szymanski and Smith (1997) reported a similar finding using a data set of 48 clubs over the period 1974–89. Thus we find no evidence that causation flows in the opposite direction, from position to wages rather than from wages to position. Time dummies were included in some versions but were not significant.

The variable measuring the percentage of annual appearances by black players accounted for by each club is negative and significant for the full sample. This means that a club with a higher than average proportion of black players would expect to achieve a systematically higher league position than the wage bill would appear to justify. This gain would be achieved at no extra financial expense. The fact that this opportunity is implied by the data suggests that a black player receives a lower return on his talents than a white player of equal ability. Columns 2 and 3 indicate that this discrimination effect is much more pronounced in the 1986–93 period than in the 1978–85 period. The small coefficient in the earlier period is probably a consequence of the small number of black players in professional soccer up to that date (about 3 percent of all appearances in the first period compared to around 7.5 percent in the second). Columns 4 and 5 indicate that the effect of appearances of black players is more pronounced in the clubs with larger ground capacities (generally the more successful clubs) than in the smaller clubs.

The cost penalty associated with a taste for discrimination depends on the overall standard of the team aimed at by the club. Discrimination is more expensive at the top end of the league than at the bottom end since the total player spend is proportionately higher. The cost also varies from year to year because of the high rate of player wage inflation. The estimates imply that a club hiring no black players would have paid a 5 percent premium in terms of its total wage bill to maintain any given position in the league compared to a non-discriminating team (i.e., one that hired an average number of black players). Given that a top club in 1993 had a total wage bill of around £5 million, this implies a cost penalty of around £250,000 (by 1993 the average team fielded two to three black players).¹⁹

VI. Robustness and Conclusions

This paper has shown that soccer clubs in England hiring a below-average proportion of black players have tended to perform worse

¹⁸ Recall that better league performance leads to a smaller value of the position variable.

¹⁹ Given that by 1998 club wage bills in the top division had reached £15 million, the cost of discrimination is rising.

than would have been predicted in the market. From this it can be inferred that those owners hiring a below-average proportion of black players have been discriminating, and for this they have paid a premium in the player market. This inference does not rely on the heroic assumption that all the factors that determine player productivity have been captured in the regression (as in the earnings function approach). Instead, the critical assumption is that there is an efficient market for talent.

The hypothesis of player market efficiency is supported by the evidence that such a large proportion of the variation in league performance can be attributed to wage expenditure alone. However, if other variables that might affect productivity also turned out to be significant in the regression, then the hypothesis is undermined. Experiments were carried out including variables accounting for managerial performance,²⁰ the proportion of players developed entirely within the club (as opposed to bought on the market), and the total number of professionals in the squad. These variables turned out to be insignificant. For example, the proportion of homegrown players in a squad was positively correlated with league performance (correlation coefficient .38), but once the effect of the wage bill was allowed for, clubs with a greater proportion of homegrown players did not fare significantly better than their rivals. Thus the evidence from other productivity-related variables supports the hypothesis of market efficiency.

While the evidence presented in the paper is consistent with discrimination by owners, an alternative hypothesis is that the fans discriminate and owners are only responding to the tastes of the fans (see, e.g., Gwartney and Haworth 1974; Nardinelli and Simon 1989). This was tested by running regressions for both attendance and revenues on league performance, the proportion of black players, and other relevant variables (e.g., ticket prices and success in other competitions). The proportion of black players did not significantly affect revenues or attendance, and so no evidence was found to support the hypothesis of fan discrimination (see Szymanski [1998] for further details).

²⁰ Other studies of the effect of management and coaching on team performance in English soccer have found no evidence of strong managerial effects (e.g., Audas, Goddard, and Dobson 1997). Evidence of managerial effects is much stronger in the U.S. literature (see, e.g., Scully 1994), perhaps because of the rookie draft and the more limited nature of player trading in the United States. In soccer the players themselves are able to appropriate almost all the rents that accrue to the improvement of their talent, regardless of how the improvement was achieved. Most managers see themselves simply as selectors. In the words of Johan Cruyff, one of the greatest players of all time and a manager of many years' experience, the job of the manager "is to look for good players and put together the best possible squad. If your players are better than your opponents, 90 per cent of the time you will win" (King and Kelly 1997).

The findings in this paper are consistent with the notion that some soccer club owners indulge what Becker described as a “taste for discrimination.” As Arrow (1973) pointed out, in a competitive market, this kind of discrimination would be competed away since non-discriminatory firms would hire the black players (because they were cheaper). Such firms would be more successful than discriminating firms, and so the latter would be driven from the market; the wages of black players would be bid up and the returns to talent would be equalized. Historically there has been a very limited market for corporate control, and clubs have tended to be “hobby” businesses for wealthy businessmen. However, in recent years a market has begun to emerge. The first major club to float on the stock market was Tottenham Hotspur in 1983, followed by Manchester United in 1991. Then in 1996/97 (outside of the sample period) a further 18 clubs raised capital on the stock market in one form or another. The introduction of professional investors might lead to the elimination of discrimination in the sense used here.

The market test of discrimination is in many ways preferable to the usual earnings function approach. Its main advantage is that it is not subject to the usual omitted-variable bias problem. It is also informationally less demanding, in the sense that once wages and team (or firm) productivity are known, no other data are required. Indeed, while a detailed analysis of the characteristics of black players was performed for this paper and contrasted with nonblack players, the differences identified are not relevant to the finding of discrimination. All that is required to infer discrimination is that a team with an above-average proportion of black players would have performed better, *ceteris paribus*, than its wage bill warranted.

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