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Gate-sharing and talent distribution in the English football league

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Gate Sharing and Talent Distribution in the English Football League

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Abstract

Using a data base of the movements of over two thousand professional footballers in the top two divisions of the English Football League between 1969 and 1995, this article examines the impact on talent distribution through the movement of players after gate-revenue sharing was abandoned in this league in 1983 and compares the results with the predictions of the Walrasian and Nash theoretical models presented by Rottenberg (1956), Quirk and Fort (1992), Vrooman (1995), and Szymanski and Kesenne (2004). It is found that there is an increased probability that players would move from teams in the second tier of the league to teams in the first tier after gate-sharing was abolished. We also find that there is increased probability that players will be transferred within divisions. These results go against one of the main theoretical predictions of the sports economics literature – that gate sharing will have no effect on competitive balance.

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1. Introduction

In the growing literature on the economics of sport, the issue of revenue – sharing has been fairly prominent. This is not surprising since, as one of the policies, along with salary caps, that can be used to restore or improve competitive balance in a sports league, its efficaciousness is of some importance to sports league administrators.

Revenue sharing is, or has been, a feature of many sports leagues and normally takes the form of sharing broadcast revenues or gate revenues. For example, the broadcast revenues that accrue to the English Premier League (EPL) are shared between clubs in a formula that includes a proportion of equal shares, a proportion dependent on finishing league position and a proportion dependent on the number of televised games. There is currently no sharing of gate revenues in the EPL. However, in American Football's National Football League (NFL) broadcast revenues are shared equally between teams and gate revenue is split 60-40, with the visiting team getting 40% of the gate.

Revenue sharing is adopted by sports leagues in an effort to rebalance the discrepancy between the revenues of large and small market clubs and thus to maintain competitive balance. The mainly theoretical research that has been done on this topic throws doubt on the effectiveness of this policy however. Some authors suggest that revenue sharing will have no effect on competitive balance whilst others conclude the policy may have a detrimental effect. There has been much less empirical work on the effects of revenue sharing¹. This is mainly due to the fact that revenue sharing arrangements, particularly gate-sharing, change infrequently in a single league.

¹ Maxcy (2007) is an exception.

In this paper we investigate the abandonment of gate-sharing in the English Football League in 1983. This change in revenue-sharing arrangements takes the form of a natural experiment and enables us to examine the consequences for competitive balance by examining the pattern of player mobility before and after the change. The rest of the paper is organised as follows. Section 2 briefly outlines the history of revenue sharing in English football up until its cessation. Section 3 reviews the theoretical literature on revenue sharing in sports leagues and identifies some testable propositions. Section 4 describes the empirical methodology to be used, whilst Sections 5 and 6 focus on the data set for the study and discuss the results of our estimation. Section 7 provides some conclusions and suggestions for further research.

2. Gate Revenue Sharing in the English Football League

A gate-sharing arrangement in the English Football League dates back to the first official rules of the League in 1889 which state: *“Each club shall take its own gate receipts, but shall pay its opponents a sum of £12”* (Inglis (1988) p.16). This arrangement continued until the Annual General Meeting of 1917 when change was prompted by the financial difficulties experienced by many clubs during and after World War One. At this meeting the Management Committee ruled that each club must pay 20% of its gate money to the away team in the Principal Competition (which consisted of matches in the first half of the season), and contribute 20% of the proceeds from the later Subsidiary Competition to a pool which was later then divided equally among the members². This 20% gate sharing distribution was generalised at a Special meeting in 1919 when it was agreed that clubs would pay the visitors 20% of net receipts (Inglis (1988) p.99-103). This arrangement remained intact until 1983

² In this same 1917 meeting the League introduced a 1% levy on gate receipts which went into a Pool Account. This money was distributed equally between the ninety-two clubs. This policy continues although the levy varied over the years.

when the Annual Meeting of the Management Committee voted to allow clubs to keep all the receipts from their home matches – less a 4% pool levy.

The decision to abandon gate-sharing was prompted by the state of severe crisis prevalent in English football during the 1980s. During this period English football came under serious threat as the English “national game” from the inter-linked issues of falling attendances, hooliganism and financial difficulties³. These problems for the League administrators were exacerbated by the fact that a group of leading clubs in the First Division of the League started to resent the requirements of revenue and power sharing with smaller clubs and subsequently threatened to form a breakaway league⁴.

3. Literature Review

The impact of revenue sharing on competitive balance has become a standard problem in the sports economics literature. Two theoretical approaches have been used – these have become known as the Walras and Nash equilibrium models. The principal difference between these two models is that the supply of labour is fixed in the Walrasian model but flexible in the Nash model.

The benchmark model of a professional team sports league was established by El-Hodiri and Quirk (1971). This was based on the principles expounded in Rottenberg’s (1956) seminal article and provided formal support for his concept of an “invariance proposition,” which maintained that the introduction of player market regulations such as reserve clauses, salary caps and revenue sharing, etc. will have minimal impact on the talent distribution between clubs and consequently little effect on

³ Aggregate attendances dropped to an all-time low of 16.4 million in season 1985-86; there was a mass riot at Luton Town’s Kenilworth Rd ground after an FA Cup tie on March 1985 injuring 47 people, mostly police officers; Fifteen league clubs had to rescued from extinction between 1978 and 1986 (Inglis (1988), p. 296)

⁴ Although the resentment was mainly financial, another main bone of contention was what the large-market clubs viewed as a skewed (in smaller clubs favour) voting system. (Inglis (1988), p.324)

competitive balance. With particular reference to gate-sharing, Quirk and El-Hodiri (1974), and then Quirk and Fort (1992) and Vrooman (1995), have demonstrated that sharing gate revenue in a fixed proportion has no effect on competitive balance in a league with profit maximizing owners with the assumption that there is a competitive market for professional athletes with a fixed supply of playing talent. This approach corresponds to the characteristics of the closed major leagues in North American sports.

Recently, however, this standard model has been challenged by what has become known as the Nash equilibrium model, proposed by Szymanski (2004) and Szymanski & Kesenne, (2004). This approach is similar to the standard model except that it assumes that the supply of talent is flexible. It is suggested that this flexible-supply model corresponds to the characteristics of European professional sports and particularly soccer, where there are multiple national leagues, and a competitive European or even global market for athletes' services. Given these features, it is suggested that talent supply can no longer be considered as a constant in each national league.

What is concluded using both of these models, is that the impact of revenue sharing depends to a large extent on factors such as the objectives of team owners, the preferences of fans, and the actual arrangements for revenue sharing⁵. Kesenne (2007) summarises the predictions of the effect of gate sharing for various scenarios. If we assume that team owners are profit maximizers it is predicted using the Walrasian model that gate sharing shifts the talent demand functions of the large and

⁵ Fort and Quirk (1995) find that under profit maximization the presence of unshared local broadcast revenues can overturn the invariance result. Whilst acknowledging that broadcast revenues did exist during our period of investigation, they only became significant towards the end of the period and therefore should impact on the findings

small market clubs by the same amount so that gate sharing, or its removal, does not affect the distribution of talent. This conforms to the invariance principle described above. However, Kesenne (2007) p.17 shows that if a quadratic revenue function is used instead of a concave function, gate sharing can have a positive effect on talent distribution due to the shift in the talent demand curves being different for each club. It follows that, using these assumptions; the removal of gate sharing will worsen competitive balance. If the objective of owners is to maximize wins, the Walrasian model predicts that large-budget clubs will lower their talent demand and low-budget clubs will increase their demand for talent⁶.

In contrast to the findings of the Walrasian model Szymanski and Kesenne (2004) demonstrate, using a Nash equilibrium model, that competitive balance deteriorates with revenue sharing if profit maximization is assumed. Because it lowers the marginal revenue of talent, revenue sharing somewhat counteracts the negative externalities that clubs impose on one another in the labour market⁷. It follows that the removal of gate-revenue sharing should improve competitive balance. With a win maximising objective (i.e. all net revenue is spent on talent), the Nash and Walrasian equilibria are the same and revenue sharing increases the total revenue of smaller clubs and hence improves competitive balance.

⁶ Sandy, Sloane and Treble (2006) show that by slightly modifying the assumptions of the Walrasian model, i.e. by adding unshared post-season revenue; or by modelling the largest market team as a dominant firm with a rising marginal cost of talent, gate revenue sharing improves competitive balance (or worsened by its removal).

⁷ Szymanski & Kesenne (2004) p.115

The predictions of the literature are summarized in Table 1.

Table 1: Theoretical Predictions for Removal of Gate sharing

		Approach	
		Walrasian	Nash equilibrium
Objective	Profit Maximization	No change in competitive balance*	Improve competitive balance
	Win Maximization	Worsens competitive balance	Worsens competitive balance

Note: * unless a quadratic revenue function is used.

4. Methodology

In this paper we assess the impact of the removal of gate-sharing on competitive balance by looking at how this policy altered the pattern of player migration between clubs. An alternative approach would be to use one, or several, of the many measures of competitive balance to see whether the top two divisions of the Football League had become more, or less, competitive after this event. There are two main pitfalls with this approach, however. Firstly, there is the question of which measure of competitive balance to use. There are a profusion of these, each with its own advantages and disadvantages⁸. Secondly, this is a static approach and gives no sense of a policy having an effect on the movement of resources. Our approach is not new; indeed several other authors have attempted to observe the effect of a structural change in league regulations by tracking player movements. Cymrot (1983) explored

⁸ For a survey of measures of competitive balance see Humphreys (2002)

the effect of the introduction of free agency in Major League Baseball in 1976 on the migration pattern of free agents over the years 1976-1979 and concluded that high-quality free agents are likely to move from successful teams to teams in cities with large and growing populations. Cymrot and Dunlevy (1987) extend this study to include players eligible and not eligible for free agency between 1978 and 1980 whilst focusing on gains in potential earnings. They find that movement is associated with the expected gain from earnings for eligible players but not for those ineligible for free-agency. More relevant and more recent is the work of Maxcy (2007) who tracks the transfer rates of players after the introduction of a redistributive revenue sharing scheme in Major League Baseball in 1997. His results suggest an the increased flow of productive talent away from the lowest revenue clubs after the change⁹.

Given the above rationale we aim to elicit information about the mobility characteristics of our sample of players after the removal of gate-revenue sharing. To do this a multinomial logit model is used. This is an appropriate technique because there are multiple outcomes and the explanatory variables will be characteristics of the choosers. The dependent variable in this study is the destination of the player at the end of a particular season (*STATUS*). In order to make the multinomial logit tractable, three categories were selected and the end-of-season destinations were coded as follows; 0 = if the player stayed with the same club (whether the club were promoted or relegated), or quit League football; 1 = if the player transferred to a club within the same division; 2 = if the player was transferred to a club in a lower division; 3 = if the player was transferred to a club in a higher division. The independent variables represent performance characteristics of players that would be

⁹ Gandelman (2008) also investigates patterns of player mobility (in Uruguay) but this work is attempting to establish the existence of “assortative matching”, i.e. whether better performing workers (players) get promoted (move to a bigger club) more often than poorer performing players. No change in the structure of league rules is incorporated.

expected to determine the choice of regime. *A priori*, one may expect players with above average or below average performance to be transferred to clubs in higher or lower divisions respectively.

The explanatory variables selected reflect the main performance features of the players in the sample and the data available. The number of times a player is selected to play for the first team is measured by the number of appearances made in a season, (*APPS*). The number of times the player is a named substitute is also included as a regressor (*SUB*), as is the number of goals scored in a season (*GOALS*) and the number of goals scored in the FA Cup in a season (*CUPGOALS*). Finally, the change in gate-sharing arrangements in the Football League in 1983 is recognized by including a dummy variable coded as 0 prior to 1983 and 1 thereafter (*SHARE*).

The expression to be estimated can be written as:

$$STATUS_{ij} = \beta_0 + \beta_1 APPS_i + \beta_2 SUB_i + \beta_3 GOALS_i + \beta_4 CUPGOALS_i + \beta_5 SHARE_i$$

The response variables are the observed end-of-season status for each player indexed as j by the i th player. The discrete dependent variables are the three player movement outcomes; move within same division, move to lower division and move to higher division, with an assigned numeric value unique for each choice.

5. Data

The years 1964-1995 were used for estimation purposes because during this period the structure of the transfer system was relatively stable in English football. In 1963 players were awarded freedom of contract following the Eastham case, and in 1995 the Bosman ruling meant that transfer fees for out-of-contract players were illegal where a player was moving between one E.U. nation and another - only players still

serving contracts with their teams could have transfer fees paid for them. Our data is taken from a period between these two momentous changes in transfer arrangements.

The sample used consists of 10967 seasonal observations on 2,155 players. The data were drawn from the *Rothmans Football Yearbooks* for the corresponding years and from the online player archive at www.since1888.co.uk.

6. Results and discussion

Firstly, the descriptive statistics of performance variables for players classified under the three status conditions are presented in Table 2.

Table 2 – Summary Statistics

Performance characteristics of players stratified by status categories. Categories are: 0 = No change, team was relegated, quit/retire, promoted 1 = Transfer within same division 2 = Move to lower division 3 = Transfer to higher division				
status	Variable	N	Mean	Std Dev
0	<i>APPS</i>	9004	29.15	10.39
	<i>SUB</i>		2.71	2.58
	<i>GOALS</i>		4.70	4.66
	<i>CUPGOALS</i>		1.04	1.15
1	<i>APPS</i>	870	27.3	10.15
	<i>SUB</i>		2.66	2.62
	<i>GOALS</i>		4.99	4.56
	<i>CUPGOALS</i>		1.00	1.05
2	<i>APPS</i>	858	21.84	10.14
	<i>SUB</i>		3.17	2.74
	<i>GOALS</i>		3.35	3.30
	<i>CUPGOALS</i>		0.88	1.10
3	<i>APPS</i>	232	30.05	10.06
	<i>SUB</i>		2.27	1.98
	<i>GOALS</i>		6.59	6.07
	<i>CUPGOALS</i>		0.88	0.87

Table 2 gives an outline of the average performance characteristics of players in each end-of-season status classification. These summary statistics show that players who were transferred to a club in a higher division had made a greater number of appearances in a season, on average, than those in the other three categories. These players had also scored a higher average number of league goals in a season and were named as a substitute less often. These findings confirm our prior expectation that higher quality players are more likely to be transferred to clubs in a higher division. However, the statistics also show that these players scored fewer Cup goals than those who did not change club and those that were transferred within the same division. But we are not putting too much weight on this latter finding given the intermittent nature of cup competitions.

Table 3. *Parameter estimates from the multinomial logit (unordered) model on end-of-season destination outcomes*

Variables	P_S / P_N	P_L / P_N	P_H / P_N
<i>APPS</i>	-0.68×10^{-9} (-0.007)	$-0.19 \times 10^{-2***}$ (-3.41)	$-0.15 \times 10^{-2*}$ (-1.78)
<i>SUB</i>	0.87×10^{-4} (1.18)	$0.70 \times 10^{-3***}$ (9.33)	$-0.27 \times 10^{-3*}$ (-1.95)
<i>GOALS</i>	$0.30 \times 10^{-3*}$ (1.65)	-0.97×10^{-4} (-0.60)	0.65×10^{-4} (0.21)
<i>CUPGOALS</i>	0.13×10^{-3} (1.40)	$-0.39 \times 10^{-3***}$ (-3.73)	0.15×10^{-3} (0.90)
<i>SHARE</i>	$0.41***$ (5.48)	-0.16×10^{-2} (-1.26)	$0.50***$ (3.51)
$N = 10965$ LR stat. = 171.93; pseudo $R^2 = 0.12$ Prob. > $\chi^2 = 0.000$ log-likelihood = 6958.856			

P_N , P_S , P_L and P_H are the probability of players staying with the same club, being transferred to a club within the same division, being transferred to a club in a lower division or being transferred to a club in a higher division at the end of a season respectively.

***, ** and * are statistically significant at 1%, 5% and 10% level, respectively. Figures in parentheses are the t -statistics.

Table 4. *Marginal effects on the probability of an outcome for a change in regressor*

Variables	$\partial P_N / \partial X_k$	$\partial P_S / \partial X_k$	$\partial P_L / \partial X_k$	$\partial P_H / \partial X_k$	Mean of X_s
<i>APPS</i>	0.14×10^{-3} (1.76)	0.11×10^{-4} (0.165)	-0.13×10^{-4} *** (-3.41)	-0.24×10^{-4} (-1.62)	26.76
<i>SUB</i>	-0.45×10^{-4} *** (-6.46)	0.23×10^{-5} (0.48)	0.48×10^{-4} *** (9.75)	-2.43×10^{-5} (-2.43)**	-508.59
<i>GOALS</i>	-0.13×10^{-4} (-0.78)	0.20×10^{-4} * (1.70)	-0.84×10^{-5} (-0.74)	0.89×10^{-5} (0.17)	-46.15
<i>CUPGOALS</i>	0.15×10^{-4} (1.57)	0.10×10^{-5} * (1.72)	-0.28×10^{-4} *** (-3.90)	0.31×10^{-5} (1.03)	-812.79
<i>SHARE</i>	-0.14×10^{-1} *** (-7.07)	0.26×10^{-1} *** (5.97)	-0.29×10^{-2} *** (-7.0)	0.82×10^{-2} *** (3.88)	0.65×10^{-1}

P_N , P_S , P_L and P_H are the probability of players staying with the same club, being transferred to a club within the same division, being transferred to a club in a lower division or being transferred to a club in a higher division at the end of a season respectively.

***, ** and * are statistically significant at 1%, 5% and 10% level, respectively. Figures in parentheses are the *t*-statistics.

(Tables 3 and 4 here)

The parameter coefficients of the multinomial logit model are shown Table 3. The estimation technique is full information maximum likelihood. The pseudo- r^2 indicates that the model explains about 12% of the variation in end of season status. Whilst this indicates a low predictive value, the log likelihood ratio chi-square value was significant indicating that the slopes are not zero.

First, the results from the *multinomial logit* model are discussed. The coefficient on *APPS* suggests that the odds of a player being transferred to a club within the same division, being transferred to a club in a lower division or being transferred to a club in a higher division at the end of a season, all decrease for players with more appearances. The effect is very small with respect to all three end-of season destinations and is only statistically significant (at the 5% level) for those players

transferred to a lower division club at the end of the season. This latter finding conforms with our prior expectations that a player who appeared in the first team on a regular basis is less likely to be sold to a lower ranked club. The results for the *SUB* variable imply that an increase in the number of times that a player is named as a substitute increases the likelihood of being transferred to a club within the same or a lower division, but decreases the odds of being transferred to a club in a higher division, this latter effect being significant at the 10% level. This implies that players that are on the fringes of first-team action will be offloaded at the end of the season, whilst players who will attract the attention of clubs in a higher division are more likely to be in the starting eleven. More league goals scored (*GOALS*) increases the odds of being transferred to a club within the same division, or being transferred to a club in a higher division at the end of a season, but decrease the odds being transferred to a club in a lower division or being transferred to a club in a higher division at the end of a season respectively. As expected, more prolific scorers will be attractive to other clubs. The effects are the same for the number of cup goals (*CUPGOALS*) scored with the negative effect for being transferred to a lower division club being statistically significant at the 1% level. The sign of the coefficients on *SHARE*, the dummy variable included to pick up the change in gate-sharing arrangements in 1983, imply that odds of being transferred to a club within the same division or a higher division increased after this change. Both of these effects are statistically significant at the 1% level. However, the odds of being transferred to a lower division club decreased after 1983. But this finding is not statistically significant. One interpretation of this result is that the demise of gate-sharing arrangements led to an increase in the revenues of larger clubs who are more likely to be in a higher division, and the reduction in the revenues of smaller clubs. Both of

these effects would tend to make it more likely that players would move to higher division clubs. The fact that players would be more likely to move to a club in the same division club can be explained in a similar way since players could be moving to larger-market clubs in the same division. The finding that the removal of gate-sharing arrangements led to an increased probability of players moving from a lower division club to a higher division club suggests that the distribution of playing talent became more uneven after this policy was implemented. This finding also militates against the prediction of the invariance thesis, when applied to profit maximizing teams, that gate revenue sharing, or its removal, will have no effect on competitive balance. However the predictions of both the Walrasian and Nash approaches under the assumption of win maximization; that the removal of gate revenue sharing will worsen competitive balance, are supported by the results.

The linear marginal effects on the probability of an outcome were also evaluated at the firm mean value of the regressor variables and the results are presented in Table 3. These results largely confirm those discussed above. There is only one anomaly in the results; the table shows that for an increase in the number of appearances, the probability that a player will be transferred to a club in the same division will increase. But this effect is not significant.

7. Conclusions

In this paper we consider the effect that the ending of the requirement for football clubs in England to transfer 20% of the revenues from their home games had on the distribution of talent in the top two divisions of the Football League and hence on competitive balance in the Football League. Using a multinomial logit model and a sample of over two thousand players for which we track movement between clubs we find that the removal of gate-sharing increased the probability that players would

move from teams in the second tier of the league to teams in the first tier. We also find that there is increased probability that players will be transferred within divisions. These results go against one of the main theoretical predictions of the sports economics literature – that gate sharing will have no effect on competitive balance. One of the main possible explanations for this in the context of the English football league is the objectives of the owners of teams. If the objective is win maximization then the prediction of both of the main theoretical approaches – Walras and Nash – is of a worsening of competitive balance when gate revenue sharing is removed. This supports the contention of many authors that the objective of owners of English football league clubs is not profit maximization but win maximization, or is the maximization of a richer utility function¹⁰.

Although the results of this paper provide us with some insight into the general effects of revenue sharing, further research is required before we can make more substantive statements or conclusions. The acquisition and incorporation of richer data on the performance of players from sources such as the Opta Index would be such a step forward and may further light on this important area of research.

¹⁰ See Szymanski (2003) pp.1170-1171 for an outline of their work.

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