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League-Revenue Sharing and Competitive Balance

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ABSTRACT

This paper contributes to the debate on revenue sharing by considering the effect of an increase in shared league-revenue on competitive balance in a league comprised of profit-maximising clubs compared with a league comprised of win-maximising clubs. Taking into account the effect of the relative (but not absolute) quality of the teams on the clubs' revenues, it is shown that under win maximisation increases in shared league-revenue tend to increase competitive balance and raise player wages. This is different from the case of profit maximisation, where increases in shared league-revenue have no impact on either competitive balance or player wages.

1 INTRODUCTION

In his *Journal of Sports Economics* article 'Revenue Sharing and Competitive Balance in Professional Team Sports', Késenne (2000, p.56) states that the aim is ' . . . to clarify the apparent confusion in the literature about the impact of a revenue sharing arrangement on the competitive balance in a sports league'. However, the analysis of revenue sharing by

Késenne (2000) implicitly centres on the sharing of revenue generated by individual clubs such as, for example, gate revenue. This suggests another possible source of confusion in the literature, namely, that revenue sharing means different things to different authors.

From Késenne's (2000) review of the literature on revenue sharing, it is not obvious that the nature of the revenue sharing arrangements being analysed by these authors varies considerably. But a close examination of this literature reveals that the revenue sharing arrangements are not always of the gate revenue sharing-type that Késenne (2000) seems to have in mind.

For example, according to Késenne (2000, p.56), ' . . . Rottenburg (1956) argues that under the profit-maximizing assumption, revenue sharing among clubs does not affect the distribution of playing talent'. By revenue sharing, Rottenburg (1956, p.256) is referring to ' . . . the total revenues of all teams in the major leagues . . . pooled and shared equally by all teams.' Rottenburg's proposition is, according to Késenne (2000, p.56), ' . . . formally proven by El Hodiri and Quirk (1971)'. Yet, El Hodiri and Quirk (1971, p.1306) discuss only gate receipts. Fort and Quirk's (1995, p.1287) conclusion, to which Késenne (2000) refers, that ' . . . gate sharing has no effect on competitive balance in the absence of local TV', unambiguously

concerns gate revenue sharing, yet the discussion of national TV revenue sharing by Fort and Quirk (1995) is not discussed by Késenne (2000). Vrooman (1995) discusses both gate revenue sharing and the sharing of 'large market media revenues'. Atkinson, Stanley and Tschirhart (1988, p.30) consider gate receipts and national and local broadcasting receipts ' . . . having each team retain a fraction of its own revenues . . . and then receive $1/n$ of a revenue pool made up of all team's revenues, net of what each retains'. Marburger (1997, p.114) examines 'the impact of gate revenue sharing . . . ' Késenne (1996, p.15), using a win-maximising model under the breakeven restriction, points out that 'total revenues in a modern professional sportsclub [sic] not only consist of gate receipts but increasingly depend on TV-rights and sponsorship.' Yet Késenne (1996, p.19) analyses a typical (gate) revenue sharing arrangement consisting of ' . . . share μ of total revenues going to the home team and a share $(1-\mu)$ going to the visiting team . . . ', which Késenne (1996, p.19) shortly after describes as 'gate sharing arrangements'. Finally, Rascher's (1997, p.35) discussion of revenue sharing is restricted to gate receipts, since 'television, merchandising, and franchise fee revenue are not included . . .' Only in a dynamic version of his model in the appendix does Rascher (1997) consider local TV revenue, national TV revenue and franchise fee revenue.

This paper attempts to contribute to the debate on revenue sharing by analysing the effect on competitive balance and on player wages of an increase in shared league-revenue, such as from an increase in league-negotiated national TV rights revenue. Taking into account only the effect of the relative quality of teams (as measured by teams' respective win percents) on team revenues, it is shown that an increase in shared league-revenue increases competitive balance and player wages in a league comprised of win-maximising teams. This outcome is different from the outcome in a league comprised of profit-maximising teams where there is no effect on either competitive balance or player wages. The results are also illustrated using Fort and Quirk's (1995) two-team league model.

2 LEAGUE-REVENUE SHARING UNDER PROFIT MAXIMISATION

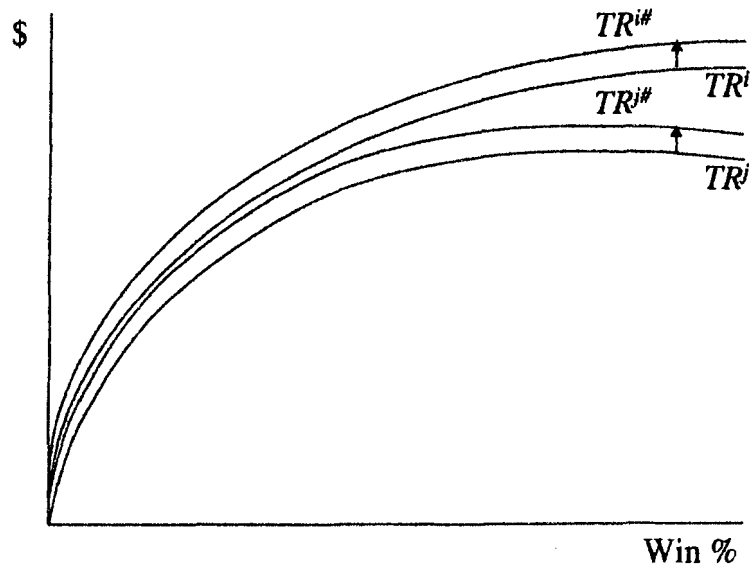
The effect of sharing league-revenue (such as the revenue derived from league-negotiated national TV rights) is to change the distribution of revenue among teams from what it would be if, for example, teams negotiated their own individual TV contracts. To begin with, Fort and Quirk (1995) argue that the revenue generated from a league-negotiated

national TV contract is likely to be greater than that generated if all clubs negotiated their own individual contracts with a TV network. Moreover, Fort and Quirk (1995, p.1291) argue that 'strong-drawing teams, which contribute more audience than weak-drawing teams, certainly are subsidising weak-drawing teams because each is receiving an equal share of national TV revenues.' But Fort and Quirk (1995, p.1291) conclude that 'national TV revenue sharing per se should have no effect on competitive balance because payments to teams are independent of each team's win-percent.' By this, I understand Fort and Quirk to mean that an increase in shared league-revenue should have no impact on competitive balance.

Fort and Quirk (1995) do not illustrate diagrammatically their conclusion that competitive balance remains unaltered as a result of an increase in shared league-revenue, perhaps because the result is intuitively obvious. This may well be so in the case of profit maximisation, but it is not under win maximisation. Therefore, a useful starting point for purposes of comparison is a diagrammatic illustration of the effect of an increase in shared league-revenue upon clubs' total revenues. Based on Quirk and Fort (1992) and Fort and Quirk's (1995) two-team league model, Figure 1 shows the effect on each individual team's total revenue (*TR*) of an increase in

(shared) league-revenue. Both team *i* and team *j*'s *TR* curves shift upward by an equal amount at every level of wins percent, the amount of the revenue distribution from the league to the team.

Figure 1 Effect on Team's Total Revenue of an Increase in Shared League-Revenue



Let us first consider the case of an increase in shared league-revenue upon the distribution of playing strength and player wages assuming profit maximisation. By way of illustration, consider the changes to Fort and Quirk's (1995) quadratic total revenue functions without shared league-revenue (TR^i and TR^j) which are of the form

$TR = aw - bw^2$,

where w is win percent.

Initially, without any shared league-revenue

$MR^i = a^i - 2b^iw^i$

and

$MR^j = a^j - 2b^jw^j$.

Equilibrium occurs when $MR^i = MR^j$, that is when

$a^i - 2b^iw^i = = a^j - 2b^jw^j$.

With the addition of some shared league-revenue (LR/n), the total revenue functions ($TR^{i\#}$ and $TR^{j\#}$) are of the form

$TR^{\#} = aw - bw^2 + LR/n$.

Letting $MR^{i\#}$ and $MR^{j\#}$ denote the respective team marginal revenue functions with shared league-revenue (LR/n), we now have

$MR^{i\#} = a^i - 2b^iw^i$

and

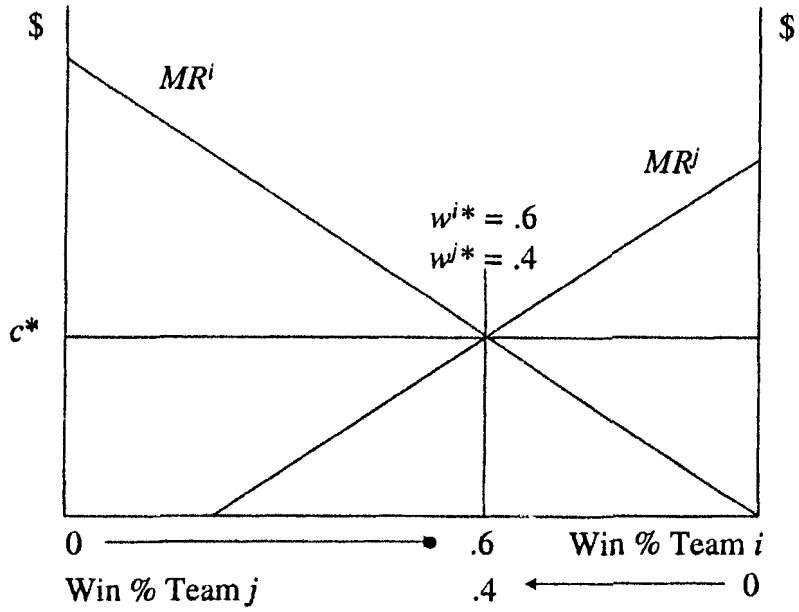
$MR^{i\#} = a^j - 2b^j w^j$.

Equilibrium occurs when $MR^i = MR^j$, that is when

$a^i - 2b^i w^i = = a^j - 2b^j w^j$.

That is, since the slope of the *TR* curves remains unaffected, there is no shift in the *MR* curves and as a result the equilibrium free agency win percents under profit maximisation shown in Figure 2 will not have changed. This also implies no change in player salaries because the equilibrium unit cost of talent will not have changed either.

Figure 2 Effect of an Increase in Shared League-Revenue on the Free Agency Outcome under Profit Maximisation



3 LEAGUE-REVENUE SHARING UNDER WIN MAXIMISATION

However, the case of league-revenue sharing under win maximisation is less straightforward. Whilst it is true that the *MR* curves are unaffected by the addition of some shared league-revenue, *AR* curves do shift with the result that the equilibrium win percents and the unit cost of player talent do

change. Again, consider the changes to Fort and Quirk's (1995) quadratic total revenue functions.

As above, these quadratic total revenue functions without shared league-revenue (TR^i and TR^j) are of the form

$$TR = aw - bw^2,$$

where w is win percent.

With the addition of some shared league-revenue (LR/n), the total revenue functions with some shared league-revenue ($TR^{i\#}$ and $TR^{j\#}$) are of the form

$$TR^{\#} = aw - bw^2 + LR/n.$$

Initially, without any shared league-revenue

$$AR^i = a^i - b^i w^i,$$

and

$$AR^j = a^j - b^j w^j.$$

Equilibrium occurs when $AR^i = AR^j$, that is when

$a^i - b^i w^i = a^j - b^j w^j$.

Letting $AR^{i\#}$ and $AR^{j\#}$ denote the respective team average revenue functions with shared league-revenue (LR/n), we now have

$AR^{i\#} = a^i - b^i w^i + (LR/n)/w^i$

and

$AR^{j\#} = a^j - b^j w^j + (LR/n)/w^j$.

The equilibrium condition with shared league-revenue is now

$a^i - b^i w^i + (LR/n)/w^i = a^j - b^j w^j + (LR/n)/w^j$.

This expression tells us that the respective AR functions shift upwards by the same amount only when $w^i = w^j$. However, at the initial equilibrium, $w^i > w^j$. This means that at this initial equilibrium the increase in AR^i to $AR^{i\#}$ is less than the increase in AR^j to $AR^{j\#}$ since $(LR/n)/w^i < (LR/n)/w^j$. Equality between $AR^{i\#}$ and $AR^{j\#}$ is restored by a decrease in w^i which increases both $a^i - b^i w^i$ and $(LR/n)/w^i$ thus increasing $AR^{i\#}$, and an increase in w^j which decreases both $a^j - b^j w^j$ and $(LR/n)/w^j$ thus decreasing $AR^{j\#}$.

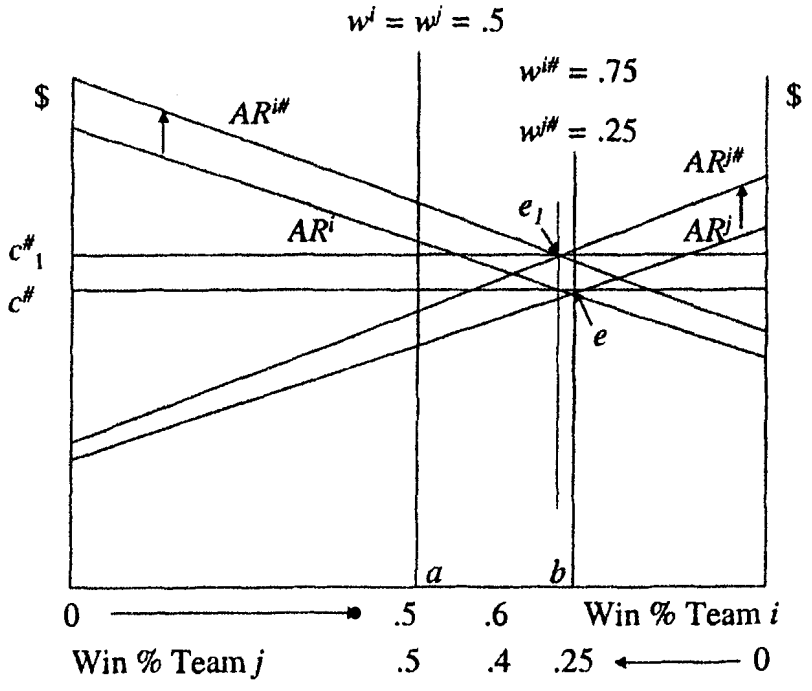
The effect of the increase in shared league-revenue on the win maximisation free agency outcome is illustrated in Figure 3. The initial win maximisation free agency outcome e ($w^{i\#} = .75$, $w^{j\#} = .25$) is at the intersection of AR^i and AR^j with a unit cost of talent equal to $c^\#$. Because an increase in shared league-revenue (LR/n) shifts each team's TR curve up by the same amount at every level of win percent, each team's AR curve shifts upwards by an equal amount at the same win percent for each team. But, since the increase in shared league-revenue is independent of win percent, the upward shift of the respective AR curves is less as each team's respective win percent increases.

Each team's AR curve shifts vertically to $AR^{i\#}$ and $AR^{j\#}$ respectively in Figure 3. The win maximisation free agency outcome is now e_1, a shift in win percent in favour of team j. At the original equilibrium e, since w^j is less than w^i, AR^j shifts up to $AR^{j\#}$ by more than AR^i shifts up to $AR^{i\#}$. With team j having less win percent (player talent) than team i at e, the same increase in total revenue means the increase in AR^j (to $AR^{j\#}$) is larger than the increase in AR^i (to $AR^{i\#}$). Team j's increase in willingness to pay (demand for) player talent at the initial equilibrium is therefore greater than

team *i*'s willingness to pay, resulting in an increase in competitive balance as player talent is competed away from team *i* to team *j*.

Another significant result is the increase in the equilibrium unit cost of player talent from $c^{\#}$ to $c^{\#}_1$. The increase in total revenue enables the teams to pay more for player talent, resulting in an increase in player salaries.

Figure 3 Effect of an Increase in Shared League-Revenue on the Free Agency Outcome under Win Maximisation



4 CONCLUSION

To summarise, an increase in shared league-revenue under win maximisation will increase competitive balance and raise player salaries. *Ceteris paribus*, if league-revenue increases and shared league-revenue becomes a larger proportion of teams' total revenues, the teams' total revenue functions become more alike and the equilibrium win percents for both teams tend to .5, with player salaries rising at the same time. This is in contrast with league-revenue sharing under profit maximisation, where increases in shared league-revenue have no impact on the teams' *MR* functions and therefore result in no change in either the equilibrium win percents or the level of player salaries.

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