BASEBALL PLAYERS LABOR MARKET

Coase Theorem.

In the absence of significant transactions cost (few parties), any asset (talent) will be used in its most efficient manner (highest marginal revenue product), regardless of ownership (reserve/transfer system or free agency.)

Invariance proposition.

"A market in which freedom is limited by a reserve rule…distributes players about as a free market would."

"No matter who owns the right to sell the contract for the services of a baseball player, the distribution of players among teams will remain the same."

Yankee Paradox.

Self-defeating dominance of the league would be internalized by the large market club.

Exploitation.

If competitive balance is unaffected by ownership then the only purpose of the reserve rule and other limitations of the labor market is to transfer rent from players to owners.

Player development expense PDX.

If teams cannot recover player development costs, then the player development system in the minor leagues would cease to exist and the quality of play will be reduced. Players are exploited to the extent that they are paid less than their marginal revenue product after player development expenses.

Marginal revenue product.

In a competitive market a player will be paid the value of his marginal revenue product. The marginal revenue product of talent is equal to the marginal product of talent multiplied by a team's marginal revenue of winning. In a monopsony market a players salary will approach his opportunity cost (reservation wage) at the limit.

Strong form invariance.

The distribution of playing talent will not be affected by any rules limiting labor market mobility. These rules (player draft, roster limits, salary caps, revenue sharing) serve only to exploit playing talent by depressing wages.

How to break up the Yankees.

The only solution is to increase competition (reduce monopoly power) in the product market where the large market club enjoys its revenue advantage. This solution uses the power of competition in the product market rather than further limiting competition in the labor market (by *increasing* monopsony power).

How to determine the marginal revenue product of talent MRP.

$$\pi_1 = R_1 - C_1$$

$$\pi_1 = R_1 [\, m_1 , w_1(t_1 , t_2)] - ct_1$$

$$MRP_1 = (\partial R_1/\partial t_1) = (\partial R_1/\partial w_1)(\partial w_1/\partial t_1) = MR_1\ MP_1 = c$$

π_1 = *profit for team 1*

R_1 = *team revenue which is a function of market size* m_1 *and win percent* w_1

$w_1 = w (t_1)$ = *win percent which is a function of relative talent* $w_1 = t_1 /(t_1 + t_2)$

$C_1 = ct_1$ = *payroll where* c = *cost per unit of talent*

$MRP_1 = MR_1\ MP_1$

MRP is the product of the marginal revenue of a win MR and the marginal product of talent MP where both are assumed to have diminishing marginal returns.

Vrooman Salary Analysis: C.C. Sabathia 2008

Base salary	$9 million
Cy Young Raise	$2 million
Total Salary 2008	$11 million

					Traded July 7 2008	
2008 Season	**W-L**	**ERA**	**IP**	**Split %**	**Games**	**Split %**
Cleveland AL	6-8	3.83	122	48.6%	89	54.9%
Milwaukee NL	11-2	1.65	130	51.4%	73	45.1%
2008 Total	17-10	2.70	253	100.0%	162	100.0%

Brewers Win %	**W-L**	**2008**
With Sabathia	90-72	0.556
Without Sabathia	89-70	0.530
Extra Win %		0.026

Milwaukee Estimated Attendance Multiple since 1998 (NL) = 4.97
Brewers extra attendance from Sabathia = 129,220 (ATT = 4.97 * .026)

Brewers 2008 total revenue multiple per fan = $60 (guesstimate)
Brewers 2008 local revenue multiplle per fan = $40 (total revenue - national revenue)

Brewers 2008 Attendance = 3,068,458
Brewers Total Revenue Estimate = $184.1 million
Brewers Local Revenue Estimate = $122.7 million

2008 Extra local revenue from Sabathia = $5.169 million ($40 * 129,220)
2008 Salary from Brewers $4.96 million (45.1% * $11 million)
Appropriate 2008 Salary for Sabathia = $11.5 million ($5.169/.451)

Source: *John Vrooman, Vanderbilt University*

John Vrooman's Salary Analysis for Prince Fielder and Ryan Braun (7 June 2011)

Prince Fielder	WAR	XTRA	MRP	Salary	Salary / MRP	Awards
2008	2.1	64,815	$2,592,593	$670,000	26%	MVP-20
2009	6.4	197,531	$7,901,235	$7,000,000	89%	AS,MVP-4
2010	2.7	83,333	$3,333,333	$11,000,000	330%	
Last 3 Seasons	**11.2**	**345,679**	**$13,827,160**	**$ 18,670,000**	**135%**	

Ryan Braun	WAR	XTRA	MRP	Salary	Salary / MRP	Awards
2008	2.0	61,728	$2,469,136	$455,000	18%	AS,MVP-3,SS
2009	6.2	191,358	$7,654,321	$1,032,500	13%	AS,MVP-11,SS
2010	4.7	145,062	$5,802,469	$1,287,500	22%	AS,MVP-15,SS
Last 3 Seasons	**12.9**	**398,148**	**$15,925,926**	**$2,775,000**	**17%**	

Contract Status

Ryan Braun	Age	Salary	Prince Fielder	Age	Salary
2008	24	$455,000	2008	24	$670,000
2009	25	$1,032,500	2009	25	$7,000,000
2010	26	$1,287,500	2010	26	$11,000,000
2011	27	$4,000,000	2011	27	$15,500,000
2012	28	$6,000,000			
2013	29	$8,500,000			
2014	30	$10,000,000			
2015	31	$12,000,000			
2016	32	$19,000,000			
2017	33	$19,000,000			
2018	34	$19,000,000			
2019	35	$18,000,000			
2020	36	$16,000,000			
2021	37	*$20,000,000			

Source: John Vrooman's calculations based on WAR metric from BaseballReference.com
WAR is wins above replacement player developed by Sean Smith of Baseballprojection.com
AS= All Star; SS = Silver Slugger

MAJOR LEAGUE BASEBALL SELECTED PLAYER CONTRACTS

ALEX RODRIGUEZ: $252M/10yrs 2001-10

Year	Club	Salary	Bonus $10M	Arbitration
2010	New York Yankees	27,000,000		
2009	New York Yankees	27,000,000		
2008	New York Yankees	27,000,000		
2007	New York Yankees	27,000,000		
2006	New York Yankees	25,000,000		
2005	New York Yankees	25,000,000	2,000,000	
2004	New York Yankees*	21,000,000	2,000,000	
2003	Texas Rangers	21,000,000	2,000,000	
2002	Texas Rangers	21,000,000	2,000,000	
2001	Texas Rangers	21,000,000	2,000,000	
2000	Seattle Mariners	4,362,500		
1999	Seattle Mariners	3,112,500		
1998	Seattle Mariners	2,112,500		
1997	Seattle Mariners	1,062,500		
1996	Seattle Mariners	442,334		
1995	Seattle Mariners	442,333		
1994	Seattle Mariners	442,333		

DEREK JETER: $189M/10yrs 2001-10

Year	Club	Salary	Bonus $16M	Arbitration
2010	New York Yankees	21,000,000		
2009	New York Yankees	20,000,000		
2008	New York Yankees	20,000,000	2,000,000	
2007	New York Yankees	20,000,000	2,000,000	
2006	New York Yankees	19,000,000	2,000,000	
2005	New York Yankees	18,000,000	2,000,000	
2004	New York Yankees	17,000,000	2,000,000	
2003	New York Yankees	14,000,000	2,000,000	
2002	New York Yankees	13,000,000	2,000,000	
2001	New York Yankees	11,000,000	2,000,000	
2000	New York Yankees	10,000,000		S: $9.5M-10.5M
1999	New York Yankees	5,000,000		W: $3.2M-5M
1998	New York Yankees	750,000		
1997	New York Yankees	550,000		
1996	New York Yankees	130,000		

CARLOS BELTRAN: $119M/7yrs 2005-11

Year	Club	Salary	Bonus $11M	Arbitration
2011	New York Mets	18,500,000		
2010	New York Mets	18,500,000		
2009	New York Mets	18,500,000		
2008	New York Mets	18,500,000		
2007	New York Mets	12,000,000	2,000,000	
2006	New York Mets	12,000,000	2,000,000	
2005	New York Mets	10,000,000	7,000,000	
2004	Kansas City Royals	9,000,000		S:
2003	Kansas City Royals	6,000,000		L: $6M-$6.95M
2002	Kansas City Royals	3,500,000		S:
2001	Kansas City Royals	425,000		
2000	Kansas City Royals	350,000		
1999	Kansas City Royals	200,000		

JASON GIAMBI: $120M/7yrs 2002-08

Year	Club	Salary	Bonus $17M	Arbitration
2009	New York Yankees**	22,000,000		
2008	New York Yankees	21,000,000		
2007	New York Yankees	21,000,000	500,000	
2006	New York Yankees	18,000,000	1,000,000	
2005	New York Yankees	11,000,000	4,500,000	
2004	New York Yankees	10,000,000	4,000,000	
2003	New York Yankees	9,000,000	4,000,000	
2002	New York Yankees	8,000,000	3,000,000	
2001	Oakland Athletics	4,000,000		
2000	Oakland Athletics	3,100,000		
1999	Oakland Athletics	2,200,000		
1998	Oakland Athletics	315,000		
1997	Oakland Athletics	205,000		
1996	Oakland Athletics	200,000		

*Texas pays remaining $4 million bonus and $67 million of A-Rod's remaining $172 million salary 2004-10
** Club buyout option of $5 million in 2009

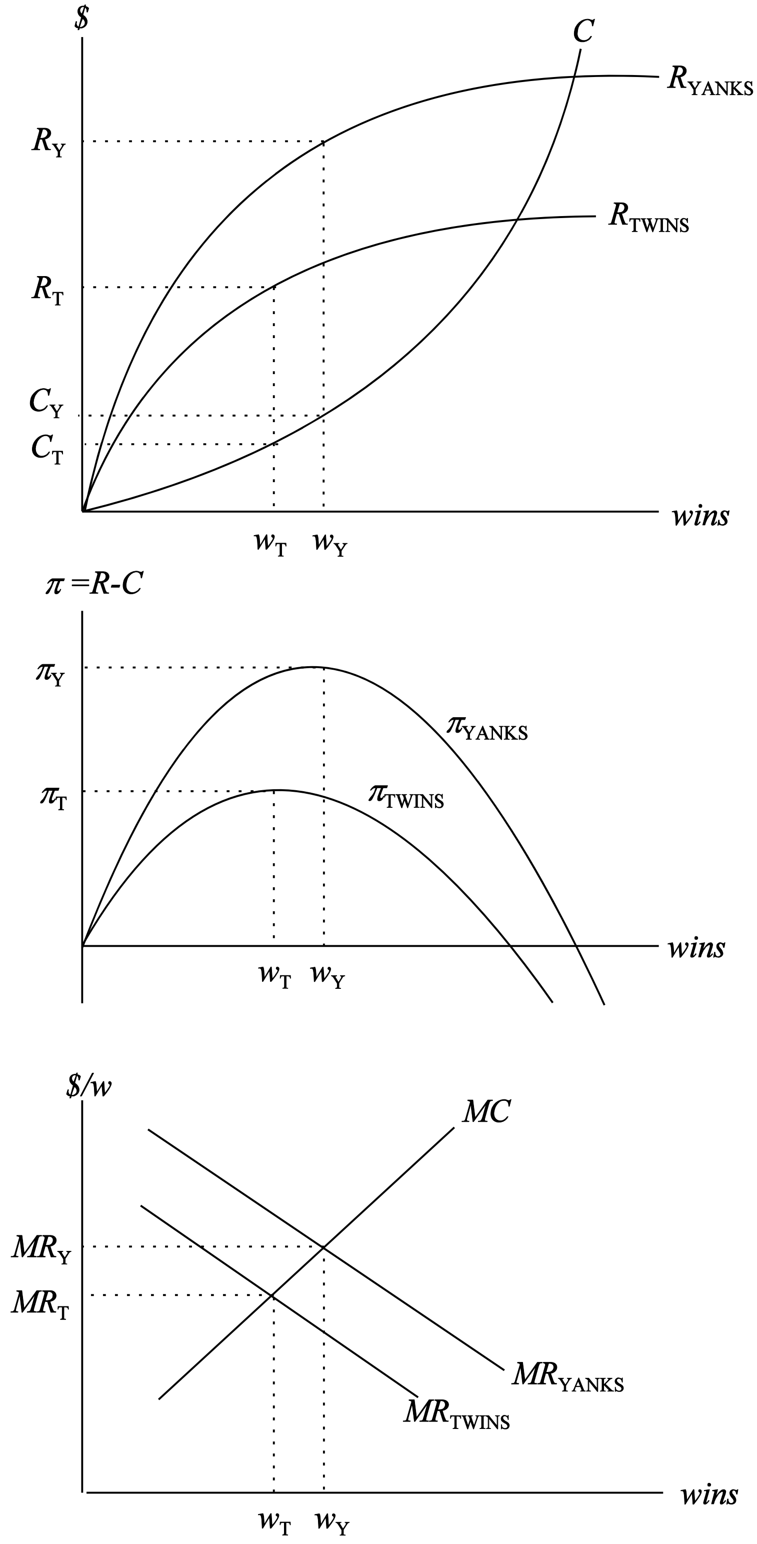

Figure 1. Unconstrained Yankee Dominance

rule went into effect. The gap in scoring between the leagues has been as large as one-half of a run. Since 1981, the year of the long players' strike, the American League has averaged 4.6 runs per game, while the National League has averaged 4.2 runs. Increased scoring in the American League has helped to draw fans to the parks. (See figure 5.1, which documents the closing gap in attendance in the American League compared to the National League after the DH rule went into effect.)

GERALD SCULLY, THE BUSINESS OF MAJOR LEAGUE BASEBALL. UNIV. OF CHICAGO PRESS, 1989.

4

League Operating Rules and the Distribution of Team Playing Strengths

In addition to the aesthetic satisfaction of watching games of a certain absolute level of quality, fans also are concerned about the relative quality of team play. It matters to fans how their favorite teams finish compared to the other teams in the league. If the relative playing strengths of teams were so unequal that team A was always victorious over teams B,C,D, . . . in the league, and team B always beat teams C,D, . . . , but always lost to team A, and so on, the outcome of the contests would be known in advance and watching them would be a colossal bore. If such win records existed within a league, a condition of absolute inequality of play would prevail and the relative quality of play would be at its lowest. Uncertainty of outcome is a necessary feature of competitive team sports, and this uncertainty is largely determined by the relative playing strengths of the teams. The more equal the playing strengths of the teams within a league, the more competitive are the contests and the more uncertain is the outcome of the game. The relative quality of play within a league is highest when the win records are equal among the teams. However, it is important to distinguish between a distribution of playing strengths that leads to mathematical equality of play (all teams having .500 records) and a distribution of skills that results in statistical equality of play (all teams having records in the long run that deviate to only some small degree from .500). In this discussion, we will use the concept of equalization of playing strengths in the statistical sense, whereby some teams win and some teams lose, but by small margins and the winners and losers change from year to year.

The relative playing strength of a team depends on the financial strength of the team and its owner. The principal source of revenues for a team is from the sale of its games at baseball parks or over the airwaves. The main cost for a team is for the player roster. In chapter 2, we discussed several agreements among the clubs that seek to restrict competition in the markets in which baseball operates. The major restrictive practices of baseball are (1) the division of geographical markets and territorial rights; (2) the cartelization of national television broadcast rights with network television; (3) the sale of expansion teams; and (4) the control of the market for players through drafting and player reservation. These restrictions have very important implications for the distribution of team playing strengths (win percentages) within the leagues.

Expected Effects of League Operating Rules on the Relative Quality of Play

Control of Entry and Territorial Rights

By restricting expansion and assigning exclusive territorial rights, the teams within a league obtain valuable monopoly rights to supply games to local markets. The value of these rights naturally depends on the size of the market and on the degree of competition from other professional sports.

Consider the value of the rights of a hypothetical team described in figure 4.1. The attendance at the games depends largely on the size of the population of the city in which the team plays, the win record of the team, and on its ticket prices. All else equal, big city franchises outdraw small city clubs, and winning teams outdraw losing teams. Also, low ticket prices draw more fans than high ticket prices. Once assigned to a particular geographical market, teams cannot change territories without league permission. Hence, choice of market size is largely beyond the control of the team, once the league is formed. Within the control of the team are its quality and ticket prices.

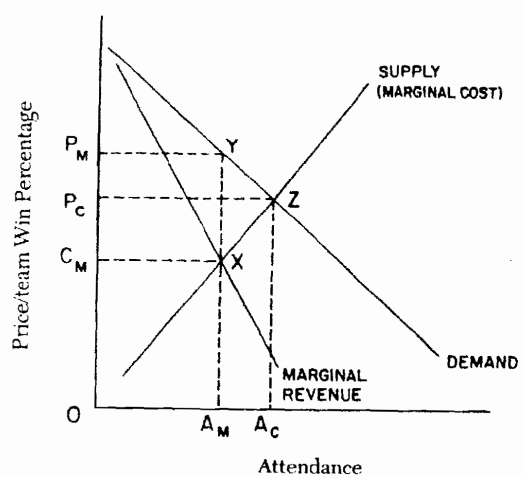

Figure 4.1 Price, Attendance, and Profits for a Hypothetical Team with an Exclusive Territory

The nominal price of a product contains much of the information necessary to make consumer choices. There is, however, much more to price than the nominal cost of the product or service. The price of attending a ball game is not just the ticket price. That expenditure may only be a small fraction of the total outlay and of the cost of foregoing other activities (the opportunity cost). Furthermore, a $5.00 ticket to watch a championship quality game is more valuable than a $5.00 ticket to watch a bush league performance. There is a quality price that affects the decision to attend games. To make the analytics simple, in figure 4.1 ticket price is divided by win percentage, a measure of team quality. The law of demand is as valid when quality price (as opposed to nominal price) is considered. Suppose the team in question is a .500 club and two nominal ticket prices are considered: $10 and $5. The respective prices per unit of quality are 2 and 1 cent per percentage point in the win record (e.g., $10/500 = 2 cents). We would expect fewer fans to attend the games of a .500 club at $10 than at $5 ticket prices. Alternatively, consider a $5 ticket price for a .400, .500, or .600 club. The respective quality prices are 1.25 cents, 1.0 cents, and 0.83 cents. At a $5 ticket price more fans will attend the games of a .600 club than a .400 club. The demand curve in the diagram asserts an inverse relationship between ticket price per unit of quality and attendance.

Next to the demand curve in the diagram is a more steeply sloped line labeled "Marginal Revenue." The demand curve or average revenue relates attendance to price. Marginal revenue is the relationship between change in total revenue (price times attendance) and change in attendance. Given fan demand, as expressed in the demand curve, the team can sell more tickets only by lowering the price of all of the tickets. For example, suppose that a team with a certain quality level would draw a million fans at a $5 ticket price. If the team charged $4, 1.5 million fans would come to the park. The total revenues are $5 million and $6 million, respectively. The increase in revenue is $1 million for the $1 reduction in ticket price and the increase in attendance is 500,000. The marginal revenue is the change in revenue divided by the change in attendance, or $2. Marginal revenue is less than average revenue or price.

The supply curve or marginal cost curve is also drawn on the diagram. The cost of fielding a team of a certain quality includes the obvious direct costs (player salaries, game costs, etc.) and the less obvious indirect or opportunity costs. It is important to incorporate foregone opportunities as a cost of providing baseball games to the fans. Opportunity costs are those profits or returns that could have been earned in the next best alternative business endeavor but were foregone in the interest of owning a franchise. Thus, opportunity costs are foregone profits. A normal return from owning a baseball team is sufficient revenues to recover costs, including opportunity costs. Revenues above that amount are not necessary and constitute an excess return or an economic rent. The supply curve is upward sloping to reflect the fact that costs rise at an increasing rate for proportional increases in win percentages. Because the supply of playing talent is limited, costs more than double for a doubling of team quality.

Axiomatically, profits are at a maximum when output is set where marginal revenue equals marginal cost. In figure 4.1, the team would charge price OP_M and OA_M fans would attend the games during the season. At price OP_M team revenues are the rectangle OP_MYA_M. Team costs are the rectangle OC_MXA_M. Team monopoly profits (recall that normal profits are included in the cost curve as opportunity costs) are revenues minus costs, or the rectangle C_MP_MYX.[1]

The implications of the analysis are that fans pay higher ticket prices, fewer fans attend games, and teams earn larger profits than in the absence of exclusive territorial rights. Given freedom of entry and of franchise movement, ticket prices per unit of quality would be set at a level just sufficient not to make it attractive for a competing team to enter the local market. In the diagram, price P_C is sufficient for the team to recover its direct and its opportunity costs. At that price OA_C fans attend the team's games. With freedom of franchise movement, prices above P_C would induce entry into the local market; prices below P_C in the long run would induce team withdrawal from the market.

While higher ticket prices and lower attendance are important welfare implications of the league restrictions on entry and territorial rights, the implication on the distribution of team playing strengths within a division or league is of greater importance to fans. The effect of the league rule of territorial exclusivity on relative team quality is shown analytically in figure 4.2. The teams are assumed to have the same market characteristics except that they are located in territories whose populations are of different sizes. The demand curves are not drawn in the diagram to avoid clutter. Since the teams compete in the same market for players, their cost functions are assumed identical ($MC_1 = MC_2$). Team 2 is located in a big city; team 1 is located in a small city. The demand in the market for the games of team 2 is greater than the demand for that of team 1. Hence, *the marginal revenue of a win is greater in the big city market than in the market of the small city.* The profit-maximizing win record for team 2 is W_2 and for team 1 is W_1. If team 1 attempts to win more games than W_1, its marginal costs will be greater than its marginal revenue and its profits will shrink. At some win record above W_1 its profits will vanish entirely and the team

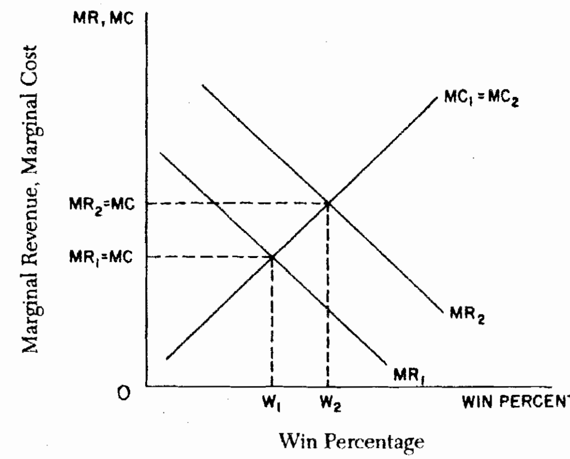

Figure 4.2 The Effect of Territorial Exclusivity on Relative Team Quality

will enter the zone of financial losses. The argument is analogous for team 2. A win record below W_2 lowers profit. Profit maximization yields a distribution of win percentages in a league determined by differences in the size of the markets for the teams' games.

Some may find this analysis too pessimistic and mechanical. After all, the pride of owners and those associated with the teams dictate a determination to be winners even if expenditures beyond those earned at the gate are required. Team owners are wealthy individuals whose desire for a championship may warrant personal financial sacrifice. And owners get more than mere money from backing a club—they get satisfaction. There is a ring of plausibility to these arguments. Tom Yawkey spent lavishly to bring a World Championship to Boston, without success. But some small city franchises have succeeded where Yawkey failed. Even if an altruistic motive in team ownership is assumed, market size constrains teams from sustaining win records beyond those warranted by fan demand. A wallet full of owner altruism in Atlanta, San Francisco, Kansas City, or Milwaukee will not produce a record that is sustainably better than that produced in New York or Los Angeles with team revenues alone. By restricting franchise movement the leagues have created the opportunity for big city dominance over the franchises located in the smaller markets. But Scully [illegible] that this is [illegible]

GATE-SHARING ARRANGEMENTS

League rules divide the gate between the home and the visiting team. Overall the split is 85–15 in baseball. Gate division differs among leagues in professional sports. In basketball and hockey, the visitor receives nothing. In football, the division is 60–40. Obviously, the more equal the gate-sharing plan among the teams, the more equal the revenues. In turn, equality at the gate leads to equality on the playing field.

If gate revenue were the sole source of revenue in baseball, as it was before broadcasting, and the receipts were evenly divided, then playing strengths would be equalized no matter how different the size of the cities in which the teams were located (the effect of broadcast revenues on playing strengths is discussed below). In figure 4.2, let MR_1 and MR_2 be the marginal revenues for the small city and the big city teams under the 85–15 gate split. The corresponding records for the team are W_1 and W_2. A change to an even share in the gate split would redistribute revenues from the big city team to the small city team. Under a 50–50 gate split the marginal revenues of the two teams would be identical. Hence, the win percentages would tend toward equality.

The unequal gate-sharing arrangement in baseball contributes to inequality on the playing field. Big city teams have relatively little interest in subsidizing small city franchises. League voting rules give the big city franchises a minority blocking coalition. Some might view a scheme of socialization of revenue with disdain. A good case can be made that there is little financial incentive to win in the NFL. Any activity taken by a team basically yields 1/28th of the net gain to that team. The remainder goes to the other 27 teams. Of course, the award of a substantial prize to the world champion would overcome the disincentive of equal revenue division during the regular season. The net gate receipts for the 1987 World Series between Minnesota and St. Louis was over $10 million, a princely sum.[2] The 26 players on the Twins each got $85,581 for the Series, while 34 Cardinal players received $56,052 each.[3]

The Cartelization of Broadcast Revenues

Prior to 1950, broadcast revenues were a very small fraction of team revenues and they were exclusively marketed by the teams in their respective local markets. Beginning in the 1950s some of the broadcasts were packaged for the national television market and these revenues were evenly divided among the clubs. By 1960, only 25 percent of total broadcast fees came from national contracts.[4] The difference in the value of the local broadcast rights was enormous. Broadcast market size and the historical performance of the team determined the value of these rights. Differences in value remain today. For example, in 1987, the New York Yankees received $17.5 million from WPIX for local TV rights, while the Seattle Mariners got $2.2 million from KIRO broadcasting.[5] Broadcast fees now are approaching 40 percent of team revenues. The growth of broadcast revenues and the inequality in the size of the local rights increases revenue inequality in the leagues. On the other hand, the national broadcast contract, which is divided equally and is becoming a larger fraction of team revenues, is a source of revenue equalization. In 1987, the network contract with NBC-TV and ABC-TV and the radio contract with CBS constituted 44 percent of the $350 million rights payments to baseball. Baseball has cartelized its national broadcast rights and skillfully negotiated with the networks.

Clubs may bargain as a cartel with the networks because Congress exempted professional sports broadcasting from the antitrust statutes when it passed the Sports Broadcasting Act of 1961. As a consequence of this exemption the value of the rights fees paid to the teams rose and the number of games broadcast declined.[6]

The combined NBC/ABC contract for 1984–89 required fee payments of $1.125 billion over the six-year period and carefully limited and divided the market for broadcast games so that each network did not compete with the other. By limiting and segmenting the national television market, baseball maximized advertising revenue to the networks. Baseball and football games draw the largest young adult male audience and this audience is particularly valued by advertisers. Naturally, the clubs extract most of the benefits from these restrictions, since the networks must compete with one another and the clubs act as a block, which controls the sole source of supply.

The contract allocated the World Series to NBC in 1984, 1986, and 1988 and the League Championship Series and All-Star game for 1985, 1987, and 1989. ABC-TV had the alternate years for these games. During the regular season, NBC had the right to telecast 30 exclusive Saturday afternoon games (with an option on five additional afternoon telecasts) and two prime-time exclusive telecasts. During these telecasts local broadcasting by the teams was proscribed. ABC obtained the right to telecast 36 regular season games of which a maximum of 20 were exclusive prime-time telecasts. The balance were nonexclusive Sunday telecasts or non-Saturday afternoon broadcasts. For the prime-time telecasts no competing local club transmissions were allowed.[7]

Divisional play-off winners are not always the teams with the best performance over the season; indeed, the team with the lower win percentage wins the divisional play-off nearly as frequently as the league leader. But the arrangement makes financial sense. The value of these games from the sale of broadcast rights alone is significant. At the time of the negotiations with the networks, the League Championship Seof the leagues comes close to achieving the ideal of equal playing strengths. There is ample evidence of long-term competitive imbalance in each league, despite the league rules that are supposedly designed to equalize team strengths. On the other hand, with all their flaws, the leagues have not only survived but have flourished, with growth in numbers of teams, in geographic coverage, in attendance and public interest, and in profitability.

Owners of sports teams, league commissioners, and most sportswriters argue that an important reason for this success is that the leagues have attained at least an acceptable level of competitive balance. They further argue that this acceptable level of competitive balance is due in no small part to the restrictions that have been imposed by owners on the player market in sports. These restrictions are the ones discussed in Chapter 5: the reserve or option clause in player contracts, combined with other devices—the college draft, the waiver system—that act to equalize access to players by teams. Owners continue to claim that if the reserve-option clause is eliminated, with players free to sell their services to the highest bidder, competitive balance within the league will be severely damaged. Wealthy owners with teams in the best markets will sign up the star players, and the resulting imbalance will lead first to the destruction of the weak teams and finally to the destruction of the league itself.

Free agency has now been a part of the labor picture in baseball and basketball since 1976, and we will want to see how the actual results from these free agency experiments square with the claims of the owners. But before doing this, we will take an excursion into the microeconomic theory of competitive balance; that is, we will examine the structure of profit incentives that operates in a team sports league and see what effects this structure has on competitive balance in a league. The arguments we will present follow closely those first developed in a seminal paper by Rottenberg (1956). Later extensions, including an explicit modeling and analysis of team sports leagues using a Nash equilibrium framework, appear in El Hodiri and Quirk (1974).

It will be easier to follow the economic argument if it presented graphically. In order to do this, we will look at the special case of a two-team league in which one team, team A, is located in a strong-drawing area, and the second team, team B, is located in a weak-drawing area. We should emphasize that the essence of the basic economic argument we will make extends to the case of a league with an arbitrary number of teams; it is only the graphics that restrict us to the two-team case.

We will assume that the revenue that any team earns from its home games depends on only two things: the underlying drawing potential of its franchise area, and the playing strength of the team relative to that

of the other teams in the league, that is, how successful the team is on the playing field. In particular, we assume that revenue from the home games of any team varies positively with the W/L percentage of the team.

JAMES QUIRK AND RODNEY FORT, PAY DIRT: THE BUSINESS OF PROFESSIONAL TEAM SPORTS

Market Equilibrium under Free Agency

PRINCETON UNIVERSITY PRESS, 1992.

We consider first the profit incentives at work in a league in which there is an unrestricted competitive labor market, with players free to sell their services to the highest bidder. For simplicity, we first consider the case where all of a team's revenues come from its own home games, that is, the case of a 100–0 gate split, as is the case in the NBA and NHL. After going through this case, we will examine what happens when there is a sharing of gate and TV revenues, as in baseball and the NFL.

Figure 7.7 shows the revenue curves for the two teams: team A, located in the strong-drawing area, and team B, located in the weak-drawing area. Revenue for each team is plotted against the team's W/L percentage, with revenue increasing as the W/L percentage increases, and with the revenue of team A higher than that of team B for any given W/L percentage.

In the upper panel of Figure 7.8, we have graphed the marginal revenue, *MR*, curves for teams A and B. For any value of the W/L percentage,

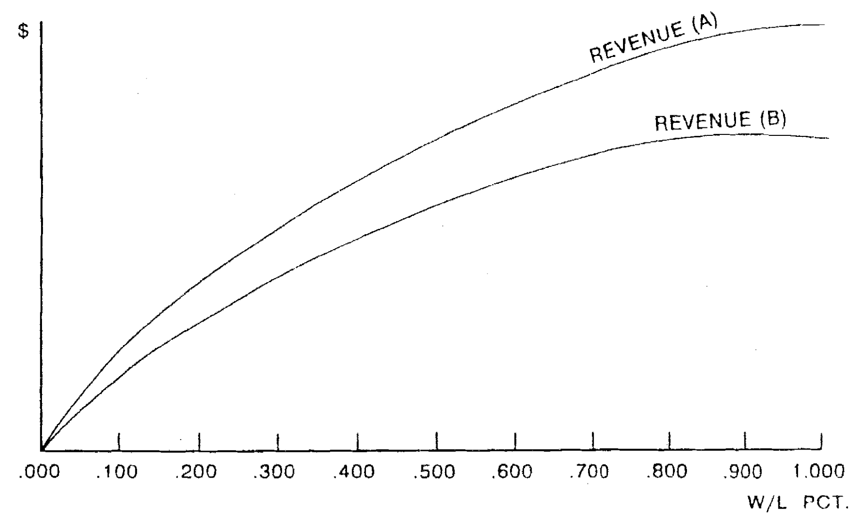

Figure 7.7 Revenue Curves, Teams A and B

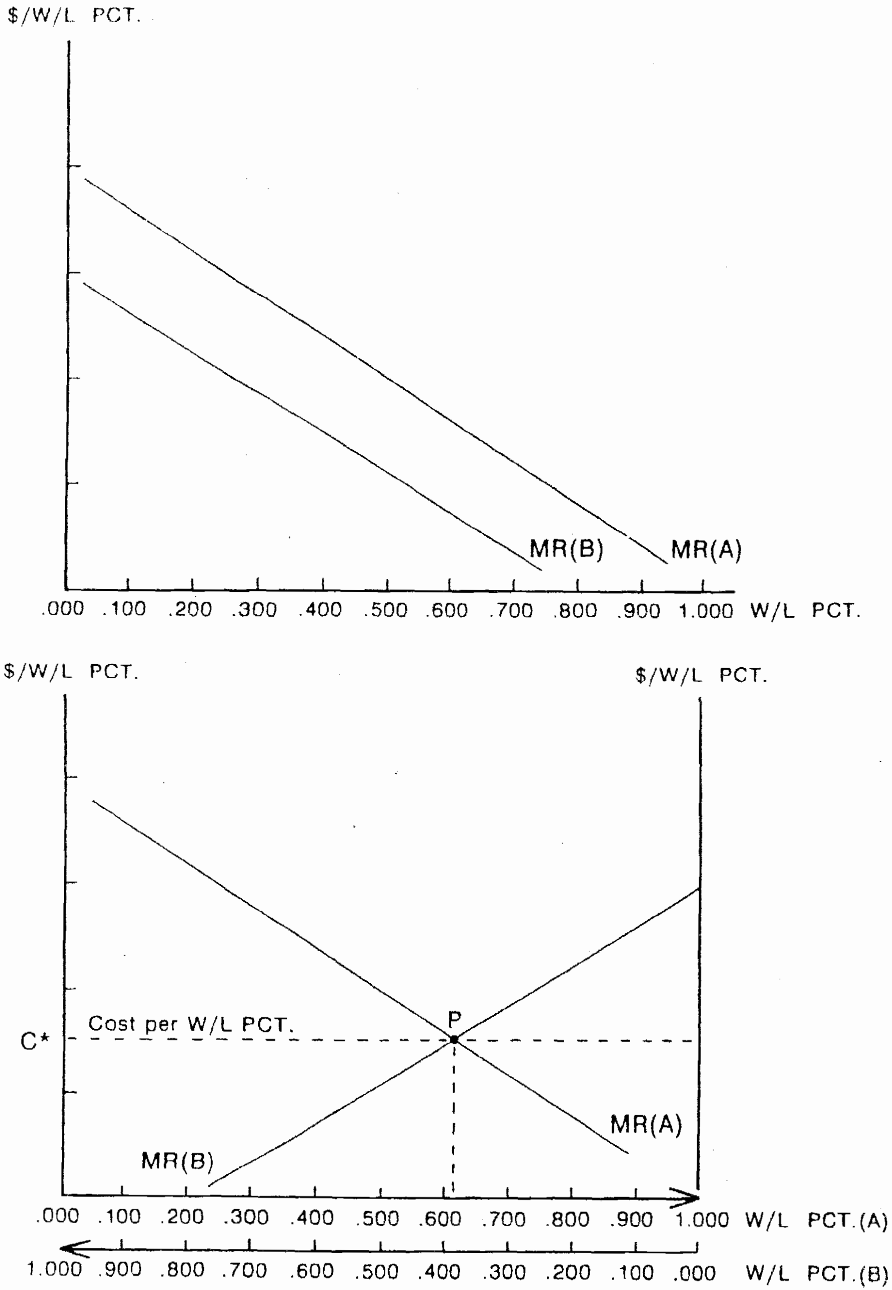

Figure 7.8 League Equilibrium: Competitive Labor Market

the *MR* curve for a team tells us the increase in revenue for the team that occurs if the team increases its W/L percentage by one point. *MR* is positive, but it falls as the W/L percentage increases—each additional W/L percentage increases revenue, by smaller and smaller increments. Again we have the *MR* curve for the stronger-drawing team, team A, lying above the *MR* curve for the weak-drawing team, team B, for every W/L percentage—winning another game adds more to revenue in the strong-drawing area than it does in the weak-drawing area, for the same W/L percentage.

The lower panel of Figure 7.8 plots the two *MR* curves on a diagram where the W/L percentage for team A reads from left to right, and the W/L percentage for team B reads from right to left, so that the *MR* curve for team B is now an upward sloping curve. We consider the case where there is unrestricted free agency and both owners act to maximize profits for their teams. The result will be a bidding up of player salaries and bonuses to the point where an additional W/L percentage point will cost each team C^* dollars, as indicated along the vertical axis, with team A ending up with a W/L percentage of roughly .615, and team B with a W/L percentage of roughly .385; that is, market equilibrium under unrestricted free agency will occur at the point *P* where the two *MR* curves cross.

Why is this? First, with unrestricted free agency, both teams will face the same market cost per unit of playing strength, and hence the same cost (C^*) to increase the team's W/L percentage by one point. Profit maximization implies that each team will add playing strength (W/L percentage points) to the point where the added revenue to the team from an additional W/L percentage point (*MR*) equals the increase in cost (C^*) to attain that. Thus when each team is maximizing profits and the player market is cleared, both teams end up with the same value of *MR*, which in turn is equal to C^*. Moreover, the W/L percentages chosen by the two teams also clearly must satisfy the condition that when we add the two W/L percentages up, they add up to unity. The only point in the lower diagram where these conditions are satisfied is *P*; hence, the point *P* defines an equilibrium for the league under unrestricted free agency.

What happens when we introduce gate and TV revenue sharing into the picture? Figure 7.9 shows the impact of sharing rules in the case of a 60–40 home-visitor sharing arrangement, as in the gate-sharing rules of the NFL. In general, consider a sharing arrangement under which the home team receives *a* percent of gate and TV revenues, and the visitor receives ($1 - a$) percent, where *a* is some number between .5 and 1. Let $R(A)$ denote gate and TV revenue at *A*, and let $R(B)$ denote gate and TV revenue at *B*. $R^*(A)$ is revenue to team A under the gate-sharing

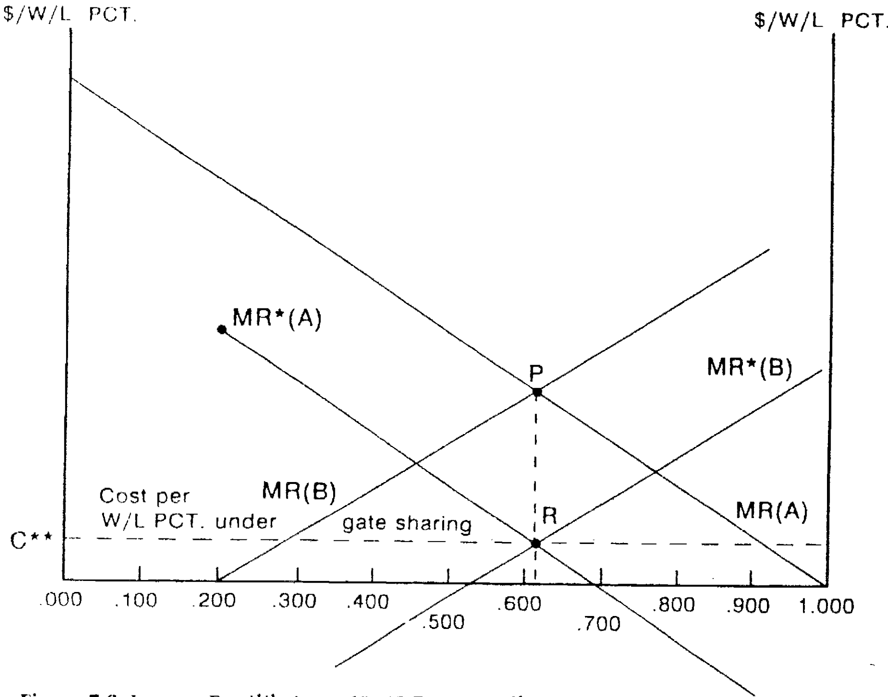

Figure 7.9 League Equilibrium: 60–40 Revenue Sharing

arrangement, and $R^*(B)$ is revenue to team B under gate-sharing. Then we have

$$R^*(A) = aR(A) + (1 - a)R(B),$$

and

$$R^*(B) = aR(B) + (1 - a)R(A).$$

Under gate sharing, marginal revenue for team A, $MR^*(A)$, is the increase in revenue to team A when its W/L percentage increases by one point. Note that in our two-team league, an increase of one point in team A's W/L percentage means that team B's W/L percentage must decrease by one point; and similarly for team B's marginal revenue, $MR^*(B)$. Thus

$$MR^*(A) = aMR(A) - (1 - a)MR(B),$$

and

$$MR^*(B) = aMR(B) - (1 - a)MR(A).$$

In Figure 7.9, $MR^*(A)$ and $MR^*(B)$ are graphed for the case of a 60–40 gate and TV split, with the two curves crossing at the point R, directly

below P. At a league equilibrium with profit maximization, $MR^*(A) = MR^*(B)$ = cost per W/L percentage point, with the W/L percentages for the two teams summing to unity. But from the expressions for $MR^*(A)$ and $MR^*(B)$ above, it can be seen that $MR^*(A) = MR^*(B)$ if and only if $MR(A) = MR(B)$. This means that introducing gate sharing leads to the same condition that held earlier; gate sharing has no effect on the distribution of playing strengths between the two clubs. Once again, as shown in Figure 7.9, team A ends up with a W/L percentage of .615 and team B ends up with .385.

So long as teams take into account in their decisionmaking the effects not only on their home gate receipts and TV revenues, but also on their revenues as a visiting team, then the W/L percentages under profit maximization and a free competitive labor market are the same whatever are the sharing rules. And what determines the W/L percentages and hence the degree of imbalance in playing strengths among teams is the disparity in team MR curves based on home gate and TV revenues only, and not the $(1 - a)$ percent of receipts that is given to the visiting team.

The fact that the two MR^* curves cross in Figure 7.9 at the point R below the crossing of the MR curves at P has some important implications. What this says is that at a league equilibrium under gate sharing, increasing a team's W/L percentage by one point is less valuable to the team than when there is no gate sharing. One reason for this is that the increase in home game revenues that results from adding a W/L percentage point is offset in part by the decrease in revenues that a team earns on the road, because its opponent will draw less with a lower W/L percentage. But if a one-point increase in the W/L percentage is worth less to teams under gate sharing, this means in turn that the salaries and bonuses that teams are willing to pay players will be less under gate sharing than when there is no gate sharing. From the point of view of profits, winning is less important under gate sharing than it is when a team's revenues come only from its home game receipts. In Figure 7.9, the market-clearing cost per W/L percentage point is C^{**}, less than C^*, the cost per W/L percentage point when there is no gate sharing. In fact, with 60–40 gate sharing as in Figure 7.9, C^{**} is only about 20 percent as large as C^*.

There is one important caveat to the conclusion that gate sharing has no effect on the degree of competitive balance in a league. Gate sharing shifts income from strong-drawing teams to weak-drawing teams, and, as we have seen, it reduces the market-clearing cost of players to teams, so it shifts income from players to owners. In the absence of gate sharing, it might be the case that some weak-drawing teams could find themselves losing money. An example is the Green Bay Packers, a small-town team that has survived in large part because of NFL gate and TV revenue sharing (and it also helps that the team is organized as a nonprofit community enterprise). So gate sharing does play a potentially important role in enabling weak-drawing franchises to survive, even though it does not affect the distribution of playing strengths among league teams that survive.

As expected, the league equilibrium under unrestricted free agency involves an imbalance of playing strengths; the strong drawing team, team A, ends up with a better team (a .615 W/L percentage in Figure 7.8 or 7.9) than the weak-drawing team (a .385 W/L percentage). This is the element of truth in the argument by owners—given that franchises are located in areas with differing drawing potential, profit incentives operating in a free competitive labor market will lead to a situation in which, on average, strong-drawing areas have strong teams, and weak drawing areas have weak teams.

However, this is still a far cry from a situation in which competitive imbalance is so extreme that only the strong-drawing team can survive, or that the league is doomed to extinction. As we have already seen, all five team sports leagues have long histories characterized by a considerable degree of competitive imbalance, even when operating under restrictions on player mobility, and they have survived. In fact, one conclusion that comes out of our analysis is that there is a limit to how many star players even a strong-drawing team would want to hire under unrestricted free agency, because, beyond the point *P* in Figure 7.8 where *MR* equals C^*, each increase in the W/L percentage adds more to the team's cost than it does to the team's revenue (*MR*) so that profits fall if the team attempts to increase its W/L percentage beyond the point *P*. This is the built-in limit on competitive imbalance in a league operating under unrestricted free agency, arising simply from profit incentives.

Market Equilibrium under a Player Reservation System

But does the degree of competitive imbalance that occurs under free agency as pictured in Figure 7.8 exceed the acceptable level of competitive balance that leagues have attained historically under their player reservation systems? In fact, what we will show is that the profit incentives associated with a player reservation system lead to precisely the same outcome in terms of W/L percentages for teams as under unrestricted free agency so long as teams are free to sell players for cash to one another.

Figure 7.10 presents the case where a player reservation system is in place, but teams are free to buy and sell players among themselves. Once again, for simplicity, we look at the case where there is no revenue sharing, but the conclusions we reach hold as well in the revenue-sharing case. In Figure 7.10, suppose that the operation of the free agent draft and waiver rules produces a situation in which, initially, teams A and B have the same playing strength (both teams have W/L percentages equal to .500). Note that at a W/L percentage of .500 for each team, $MR(A) = MR''$ is greater than $MR(B) = MR'$. This means that an additional W/L percentage point is worth more to team A than to team B. Team A would be willing to pay anything up to MR'' for an additional W/L percentage point, and team B should be willing to sell the players to provide that at any price more than MR'. Both teams are more profitable, if team B sells players to team A.

This situation continues to exist so long as players are distributed between the two teams so that $MR(A)$ is greater than $MR(B)$. With each owner acting to maximize his or her team's profits, player sales for cash will continue between the two teams until all profitable opportunites have been exhausted. These opportunities are exhausted only when $MR(A)$ is brought into equality with $MR(B)$, which occurs at the point

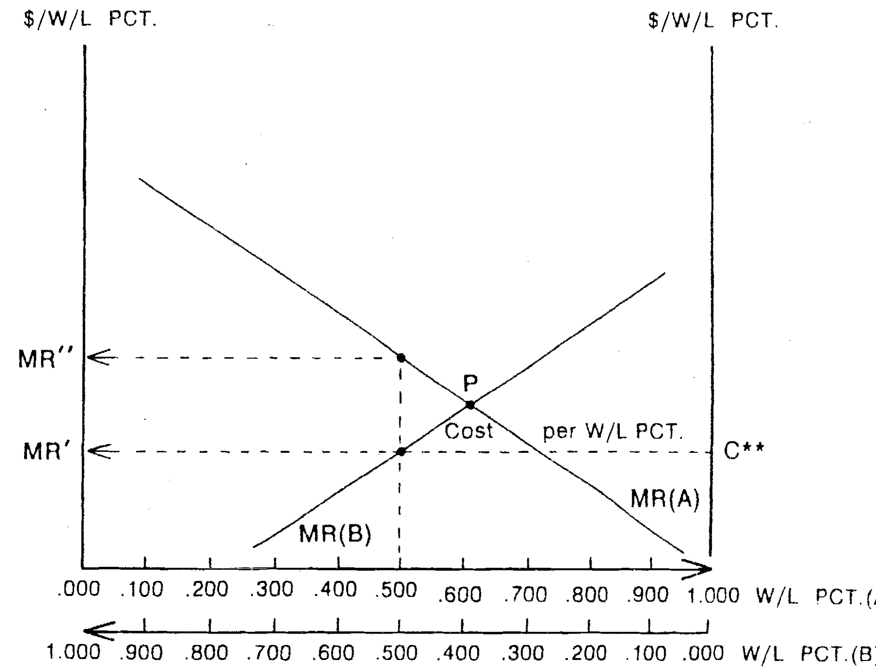

Figure 7.10 Incentives for Player Sales under the Reserve-Option Clause

P. What we can conclude, then, is that so long as there are no restrictions on the sale of players for cash in a league, profit incentives will generate precisely the same distribution of playing strengths in a league under a player reservation system as under unrestricted free agency. In effect, if profit incentives are fully exploited under a reservation system, player sales will completely offset any equalizing effects of such devices as the free agent draft or the waiver system. With unrestricted sales of players for cash among the owners of a league, a player reservation system has no effect at all on competitive balance in a league, which will be the same under a reservation system as it is under unrestricted free agency, given profit-maximizing behavior by team owners. This can be viewed as an application of the Coase theorem, which states that the allocation of resources in a society is independent of the assignment of property rights in the society, except for income effects (see Coase 1960).

Revenue sharing under a reservation system with unrestricted player sales moves the *MR* curves of the team down, but does not change the equilibrium W/L percentages of team A or team B. The closer the league sharing rules are to equal sharing, the less important winning is to the profitability of a team, just as in the case of unrestricted free agency. Revenue sharing under a reservation system thus also has the effect of reducing salaries and bonuses paid to players, again as in the case of unrestricted free agency.

Qualifications

There are some caveats to the conclusion that the distribution of playing strengths among teams is the same under unrestricted free agency as under a player reservation system with unrestricted sales of players. The player reservation system, including the college or rookie free agent draft, performs somewhat the same functions that revenue sharing does, in that it lowers salaries and bonuses paid to players (by restricting their bargaining rights), and it redistributes income from strong- to weak-drawing teams through the cash that is received by weak-drawing teams in their player sales to strong-drawing teams. Under unrestricted free agency, some weak-drawing teams might go under without the subsidies they receive from their sales of players. An example in point is the St. Louis Browns in the early post-World War II years, when the team was kept afloat almost exclusively by sales of players to other teams. If a change were to be made in a league from a player reservation system to free agency, it might be necessary to introduce more equal revenue sharing (that is, subsidization of weak-drawing

teams by strong-drawing teams) if all teams were to remain profitable after the change.

A second caveat is that team owners are not always concerned only with the profits that they can earn from their teams. There have been well known instances of "sportsmen owners" in the history of baseball, as noted earlier, including especially Phil Wrigley, who insisted on playing daytime baseball in Wrigley Park during his years of ownership of the team, despite the sacrifice of profits involved. Tom Yawkey invested large sums during the 1930s and 1940s in players for the Red Sox, to buy a winner for Boston. Recently, Eddie DeBartolo, Jr., the wealthy owner of the 49ers, has been in the spotlight, because of his lavish spending on salaries and other expenses, which resulted in four Super Bowl championships between 1982 and 1990. Dabscheck (1975), Schofield (1982), Sloane (1971), and Vamplew (1982) have presented convincing evidence that in English, Scottish, and Australian football and cricket, the profit maximization model is inapplicable, and certainly some of their comments can be taken to apply to American sports as well. Davenport (1969) emphasizes the incentive to win as motivation for owners, above and beyond profit considerations. Brower (1977), Cairnes, Jennett, and Sloane (1986), Daly and Moore (1981), and Neale (1964) all raise questions concerning aspects of the profit maximization model of team ownership.

There is no question but that owners are typically highly competitive individuals who enjoy winning intensely. There also is no question but that owners also prefer to make more profits than less. Profit maximization is of course an idealized concept that is only approximated in practice. As was pointed out in the discussion of franchise prices in Chapter 2, however, professional team sports has become such an expensive business to enter that even wealthy owners must take the bottom line seriously. Ultimately, the proof is in the pudding—either the profit-oriented model produces good predictive results or it doesn't. We will look at some of these results below.

Sales of Players for Cash—Qualifications to the Theory

One final qualification to our theoretical conclusions is that leagues have formal and informal restrictions on the sale of players for cash. In June 1976, Charles O. Finley announced the sale of three of his Oakland A's players—Joe Rudi, Rollie Fingers, and Vida Blue. Rudi and Fingers were to be sold to the Red Sox for a combined total of $2 million, and

STRONG FORM INVARIANCE WITH POOLED REVENUE SHARING

TEAM 1	TEAM 2
$R_1' = \alpha R_1 + (1-\alpha)(R_1 + R_2)/2$	$R_2' = \alpha R_2 + (1-\alpha)(R_1 + R_2)/2$
$MR'_1 = \alpha\,(\partial R_1/\partial w_1) + (1-\alpha)(\partial R_1/\partial w_1 + \partial R_2/\partial w_2\ \partial w_2/\partial w_1)/2$	$MR'_2 = \alpha\,(\partial R_2/\partial w_2) + (1-\alpha)(\partial R_2/\partial w_2 + \partial R_1/\partial w_1\ \partial w_1/\partial w_2)/2$
zero-sum league implies $\partial w_2/\partial w_1 = -1$ *so*:	*zero-sum league implies* $\partial w_1/\partial w_2 = -1$ *so:*
$MR_1' = \alpha MR_1 + (1-\alpha)(MR_1 - MR_2)/2$	$MR_2' = \alpha MR_2 + (1-\alpha)(MR_2 - MR_1)/2$

LEAGUE EQUILIBRIUM

$$MR_1' = MR_2' = c'$$

$$\alpha MR_1 + (1-\alpha)(MR_1 - MR_2)/2 = \alpha MR_2 + (1-\alpha)(MR_2 - MR_1)/2 = c'$$

$$\alpha MR_1 + (1-\alpha)MR_1 = \alpha MR_2 + (1-\alpha)MR_2$$

$$MR_1 = MR_2$$

So invariance holds true, and

$$\alpha MR_1 + (1-\alpha)(MR_1 - MR_2)/2 = c'$$

$$\alpha MR_1 = c'$$

Implies exploitation $c' = \alpha c$