Rev Ind Organ (2009) 34:5–44
DOI 10.1007/s11151-009-9202-7

Theory of the Perfect Game: Competitive Balance in Monopoly Sports Leagues

John Vrooman

Published online: 18 February 2009
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Abstract Based on the limiting assumption that sports owners are profit maximizers the *invariance proposition* holds that revenue sharing has no impact on competitive balance in sports leagues. If owners are win-maximizing sportsmen instead, then revenue sharing can lead to increased competitive balance and higher payrolls. Evidence of the *sportsman effect* is provided by erosion of monopsonistic exploitation in the four major American sports leagues where players now share about 60% of revenues. Monopsony power erosion forces sports-league cartels to exploit statutory monopoly power in monster deals for media rights fees and public venue subsidies. New evidence on competitive balance suggests that revenue sharing leads to increased balance with or without team salary caps. Optimum competitive balance is an empirical question, and the answer lies between random competition of the NFL and deterministic dynasties of the NBA.

Keywords Professional sports leagues · Competitive balance

JEL Classification L83

In theory there is no difference between theory and practice. In practice there is.
–Yogi Berra

1 Introduction

In theory the perfect game is a symbiotic contest between evenly matched opponents. The practical economic problem is that games in professional sports leagues are played

J. Vrooman (✉)
Department of Economics, Vanderbilt University, Nashville, TN 37235-1819, USA
e-mail: john.vrooman@vanderbilt.edu

between teams from asymmetric home markets that form imperfectly competitive natural cartels. Fortunately the natural duality of sports leagues implies that any team is only as strong as its weakest opponent, and that the success of any league depends on the competitive balance of its teams.

The economics of sports recently celebrated the golden anniversary of its origin in Rottenberg's pre-Coasian argument (1956) about the neutral effects of free agency on the baseball players' labor market. According to Rottenberg's *invariance proposition*, free agency for baseball players would yield the same talent distribution as the reserve system that bound a player to one team for life. The difference was that free agency would weaken monopsonistic exploitation of players trapped in the reserve system and allow players' salaries to approach their marginal revenue product.

In its stronger form the *invariance proposition* also holds that revenue sharing would not affect the talent distribution among teams and would only deepen player exploitation. The most logical way to decrease the dominance of large revenue clubs is by increasing competition in local monopoly markets, rather than increasing monopsony power in the players' labor market. The theoretical foundations of the economics of sports are found in El Hodiri and Quirk (1971) and Quirk and El Hodiri (1974). The modern awakening of sports economics came when Quirk and Fort (1992) published a popular version of Quirk's early model, followed by two separate adaptations of sports league theory to the changing realities of the American sports-scape (Fort and Quirk 1995; Vrooman 1995).

European theorists (Szymanski 2003, 2004; Szymanski and Kesenne 2004) have used non-cooperative game theory to show that the invariance proposition does not hold in open markets of European football, and that revenue sharing leads to less competitive balance. The open market distinction may not make any difference in the end, however, because both open and closed labor market models are based on assumptions that owners are profit maximizers. It is likely that sports-owners are *sportsmen* who sacrifice profit in order to win (Kesenne 1996; Sloane 1971; Vrooman 1997a, 2000, 2007). At the limit sportsman owners become win-maximizers who spend to win at all cost. The *sportsman effect* is constrained by zero-profit rather than maximum profit, and the distinction between closed or open labor markets becomes academic. If owners are sportsmen, then intuition prevails over paradox, and revenue sharing increases competitive balance.

As "natural cartels" the four major North American sports leagues have historically held major-league monopoly and monopsony power.[1] There is emerging evidence in this analysis that these leagues have become dominated by sportsman owners who are willing to pay players their average revenue product in order to win. The players' shares of revenues have recently exceeded 60 percent in each of the leagues. Erosion of monopsony power has forced sports-league cartels to exploit their monopoly power in negotiation of media rights fees and extortion of public venue cost subsidies.

[1] All four leagues were granted antitrust immunity to negotiate television rights fees collectively in The Sports Broadcasting Act of 1961. Major League Baseball (MLB) was originally granted antitrust immunity in *Federal Baseball Club of Baltimore v. The National League*, 259 U.S. 200 (1922), continued in *Toolson v. New York Yankees*, 346 U.S. 356 (1953) and *Flood v. Kuhn*, 107 U.S. 258 (1972). MLB antitrust immunity in labor matters was later reversed in The Curt Flood Act of 1998.

In 2007 the four big leagues generated monopoly revenues of almost $20 billion, led by the National Football League (NFL) with $7 billion and Major League baseball (MLB) with $6 billion. Given statutory exemption from antitrust law these four leagues have collectively negotiated total television rights fees that currently average $5.6 billion annually through 2011. Annual NFL rights of $3.7 billion double the national TV money of the other three leagues combined. From 1990 through the end of current contracts the four leagues will have received over $80 billion in TV rights fees, including $50 billion in the NFL. Under threats of relocation monopoly teams and leagues have also extorted public subsidies for over half of $30 billion in venue construction costs since 1990.

In the midst of this revenue revolution, player cost controls have become remarkably similar. All leagues except MLB have imposed salary caps just below 60 percent of league revenue. The wealthiest league is also the most egalitarian and competitive. The NFL shares two-thirds of $7 billion in revenue, compared to MLB that shares 40 percent, the NBA at 25 percent, and the NHL with 16 percent. As expected in sportsman leagues, the NFL is by far the most competitive of the four leagues.

This paper begins with a restatement of the general theory of sports leagues followed by a comparison of operating rules of the four leagues. After addressing empirical questions about the evolution of monopsony and monopoly power during the free agency era (post-1976), the argument concludes with a comparison of competitive balance in the four major American leagues.

2 Sports League Theory

2.1 Profit Maximizing Owners

Conventional theory of sports leagues (Fort and Quirk 1995; Vrooman 1995) begins with simultaneous maximization of twin profit functions in a simplified two-team league:

$$\pi_1 = R_1 [m_1, w_1 (t_1, t_2)] - ct_1 \quad \pi_2 = R_2 [m_2, w_2 (t_2, t_1)] - ct_2. \tag{1}$$

A profit-maximizing owner's objective is to max profit π_1 with respect to talent t_1. In contrast, a *sportsman* owner's goal is to maximize wins w_1, given $\pi_1 \geq 0$. Revenue R_1 of team 1 is a function of its market size m_1 and its winning percentage w_1, which is determined by a contest success function (CSF) of standard logistic probability form $w_1(t_1, t_2) = t_1/(t_1 + t_2)$, first used in a sports context by El Hodiri and Quirk (1971). The zero-sum nature of an n-team league requires $\Sigma w_i = n/2$ and $\partial w_1/\partial w_2 = \partial w_2/\partial w_1 = -1$.

At the profit maximum, team 1 sets payroll ct_1 by acquiring talent until the marginal revenue product of talent MRP_1 is equal to the marginal cost of talent c (marginal factor cost), which is assumed to be the same for both teams that share a common talent pool T:

$$MRP_1 = MR_1MP_1 = (\partial R_1/\partial w_1)(\partial w_1/\partial t_1) = c. \tag{2}$$

Simultaneous profit maximization (mutual best response) for both teams yields:

$$MRP_1 = (\partial R_1/\partial w_1)(\partial w_1/\partial t_1) = c = MRP_2. \tag{3}$$

The logit CSF $w_1 = t_1/(t_1 + t_2)$ yields the marginal product of talent MP_1:

$$MP_1 = \partial w_1/\partial t_1 = (t_2 - t_1 \partial t_2/\partial t_1)/\,(t_1 + t_2)^2\,. \tag{4}$$

which satisfies $\partial w_1/\partial t_1 > 0$; $\partial^2 w_1/\partial t_1^2 < 0$; $\partial w_1/\partial t_2 < 0$. In league equilibrium, the *MRP* for both teams is equal to their mutual wage rate c:

$$MRP_1 = MR_1 MP_1 = [\partial R_1/\partial w_1][(t_2 - t_1 \partial t_2/\partial t_1)/\,(t_1 + t_2)^2] = MRP_2 = c. \tag{5}$$

2.1.1 Open and Closed Case

In a *closed league* an inelastic supply of skilled talent $T^* = t_1 + t_2$ is fixed, and one team's talent gain is another team's zero-sum talent loss $\partial t_1/\partial t_2 = \partial t_2/\partial t_1 = -1$. Substitution into (5) yields the *closed league* equilibrium condition:

$$MR_1 = MR_2 = cT^*. \tag{6}$$

By comparison teams in an *open league* face an elastic supply of talent T at an exogenous wage rate c^*. In an *open league* team 1 talent acquisition has no effect on the talent of team 2, such that $\partial t_1/\partial t_2 = \partial t_2/\partial t_1 = 0$. Substitution into (5) yields the *open league* solution:

$$MR_1 w_2 = MR_2 w_1 = c^* T. \tag{7}$$

2.1.2 Asymmetric Markets

An asymmetric revenue advantage $m_1 > m_2$ for team 1 can be shown through a model that generalizes profit-max solutions with a parameter $\sigma > 1$. The *Yankee paradox* is the empirical argument that fans prefer close wins instead of lopsided outcomes. Fan-preference for competitive balance implies strictly concave revenue functions where $\phi \in [0, 1]$:[2]

$$\pi_1 = \sigma[\phi w_1 + (1 - \phi) w_1 w_2] - ct_1 \quad \pi_2 = \phi w_2 + (1 - \phi) w_1 w_2 - ct_2. \tag{8}$$

A *Yankee paradox* suggests $\phi = .5$, and the zero-sum constraint $w_2 = 1 - w_1$ simplifies (8):

$$\pi_1 = \sigma\left(w_1 - .5w_1^2\right) - ct_1 \quad \pi_2 = w_2 - .5w_2^2 - ct_2. \tag{9}$$

[2] Post-season championship tournaments introduce revenue convexity that polarizes regular season competition. For discussion of the *champion effect* of *UEFA* Champions League on European football see Vrooman (2007).

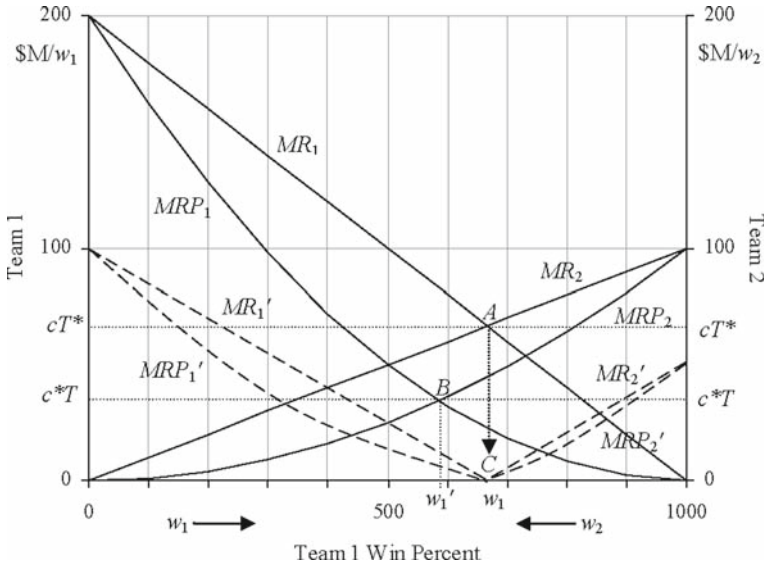

Fig. 1 Invariance Proposition

In a *closed league* from (6), simultaneous profit maximization yields:

$$MR_1 = MR_2 = \sigma w_2 = w_1 = cT^*. \tag{10}$$

Team 1 dominates a *closed league* by the imbalance ratio $w_1/w_2 = \sigma$ with respective team win percentages $w_1 = \sigma/(1+\sigma)$ and $w_2 = 1/(1+\sigma)$. League payroll is $cT^* = \sigma/(1+\sigma)$, and respective team payrolls are $ct_1 = w_1 cT^* = \sigma^2/(1+\sigma)^2$ and $ct_2 = w_2 cT^* = 1/(1+\sigma)^2$. The closed-league solution is shown at A in Fig. 1 for $\sigma = 2$, where $w_1/w_2 = .667/.333$.[3]

By comparison the σ-model *open-league* solution from (7) is:

$$MR_1 w_2 = MR_2 w_1 = \sigma w_2^2 = w_1^2 = c^* T. \tag{11}$$

An *open league* has greater competitive balance $w_1/w_2 = \sigma^{1/2}$ for team win percentages $w_1 = \sigma^{1/2}/(1+\sigma^{1/2})$ and $w_2 = 1/(1+\sigma^{1/2})$ as suggested in Vrooman (1995). The open-league Nash solution at B is compared to the closed league solution at A in Fig. 1 for $\sigma = 2$, where $w_1/w_2 = .586/.414$.

2.1.3 Invariance Proposition

The strong form of the *invariance proposition* holds that competitive balance in a sports league will be the same with or without revenue sharing. In effect revenue

[3] Revenues and costs are hypothetically shown in $ millions for $\alpha = 2$ in Fig. 1. League revenue reaches a maximum at $ 116.7 million (R_1 = $88.8 million and R_2 = $27.7 million); league payroll is $ 66.7 million (ct_1 = $44.4 million and ct_2 = $22.2 million); π_1 = $44.4 million and π_2 = $5.5 million.

sharing serves only to shift monopsony rent from players to owners. *Strong form* invariance can be shown with a straight pool-sharing formula $R_1' = \alpha R_1 + (1 - \alpha)(R_1 + R_2)/2$, where each team blends an α-share of its revenue with an equal $(1 - \alpha)$-share of a league revenue pool, where $\alpha \in [0, 1]$. The league's zero-sum win constraint implies $\partial w_1/\partial t_1 = -\partial w_2/\partial t_1$ and closed league α-sharing from (10) yields the σ-solution for $MR_1' = MR_2' = c'T$:

$$\alpha\sigma w_2 + (1 - \alpha)(\sigma w_2 - w_1)/2 = \alpha w_1 - (1 - \alpha)(\sigma w_2 - w_1)/2. \tag{12}$$

This results in the same imbalance $w_1/w_2 = \sigma$ as (10), regardless of the level of α-sharing. The second term in (12) vanishes for both teams at equilibrium ($\sigma w_2 = w_1$), and the lower league payroll $c'T = \alpha\sigma w_2 = \alpha w_1 = \alpha\sigma/(1 + \sigma)$ reveals the degree of talent exploitation equal to the league pooled revenue share $(1 - \alpha)$. The perfect syndicate solution ($\alpha = 0$) is shown at C in Fig. 1 for $\sigma = 2$, where the invariance proposition still holds and the cost per unit of talent has been reduced to the reservation wage.

By comparison the *open-league* revenue sharing solution from (11) implies:

$$2\alpha(\sigma w_2^2 - w_1^2) + (1 - \alpha)(\sigma w_2 - w_1)(w_1 + w_2) = 0. \tag{13}$$

If there is no revenue sharing ($\alpha = 1$), then the second term vanishes, and (13) reduces to the Nash *open league* solution $w_1/w_2 = \sigma^{1/2}$ in (11); but as the league approaches a perfect syndicate ($\alpha \to 0$), the first term vanishes and the second term approaches the closed league solution $w_1/w_2 = \sigma$ in (10). At the revenue sharing limit ($\alpha = 0$) open and closed league solutions are identical at C in Fig. 1. Revenue sharing in an open league *reduces* competitive balance and allows teams to collusively maximize league-cartel revenues as suggested in Szymanski and Kesenne (2004).

2.1.4 Payroll Cap in a Profit-Max League

A league-wide payroll cap constrains each team's payroll to a constant λ-share of the average club's revenue $cTw_1 = \lambda(R_1 + R_2)/2$. If CAP_1 is defined as an *iso*-payroll cap constraint for team 1 (locus of $\lambda(R_1 + R_2)/2$ for all w_1), the closed league solution is:

$$CAP_1 = MR_2 = \lambda(R_1 + R_2)/2w_1 = cT. \tag{14}$$

In order for the payroll cap to constrain team 1, $\lambda \leq 4\sigma^2/[(1 + \sigma)(1 + \sigma + \sigma^2)]$ and perfect league balance ($w_1 = w_2$) requires a cap of $\lambda = 1.33/(1 + \sigma)$. The cap-constrained solution is shown at B in Fig. 2 for $\sigma = 2$ and $\lambda = .44$. As also shown in Kesenne (2000), the effect of the payroll cap on team 1's profit is ambiguous, because gains from lower payroll $.5(c - c^*)T$ are offset by revenue losses from winning fewer games (shaded triangle between MR_1 and cT). Team 2's improvement is unambiguous because lower payroll and higher revenue increase team 2's profits from the triangle between MR_2 and cT to the triangle between MR_2 and c^*T.

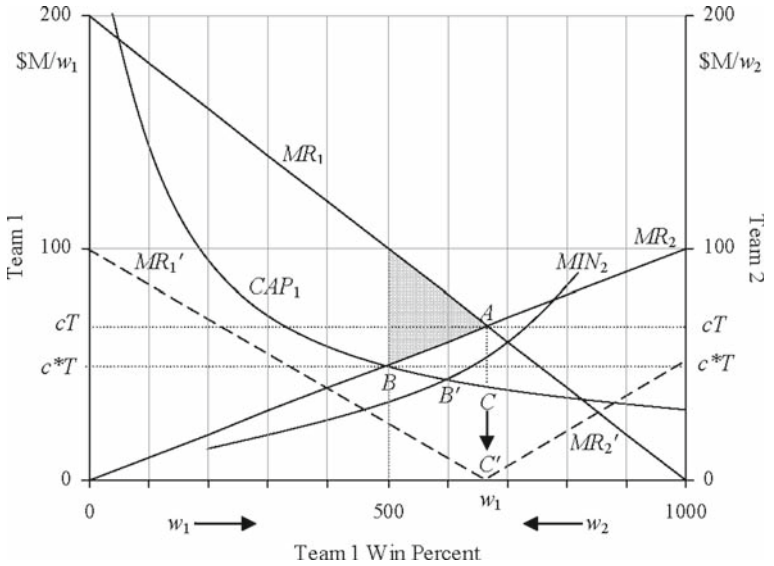

Fig. 2 Payroll Cap and Revenue Sharing in Profit-Max League

2.1.5 Joint Payroll Cap and Revenue Sharing

Team 1 has an incentive at B to circumvent the cap because $MR_1 > MR_2$ at .500. The dead-weight loss (shaded triangle between MR_1 and MR_2) suggests mutual gain from a revenue-sharing side deal between clubs. As more revenue is shared, MR_1 and MR_2 are vertically displaced downward in Fig. 2, and league equilibrium between MR_2' and CAP_1 moves along CAP_1 from B to C. CAP_1 is no longer a constraint for team 1 payrolls below C where league equilibrium is restored at $MR_1' = MR_2'$, and the original state of league imbalance $w_1/w_2 = \sigma$. As $\alpha \to 0$ league π-max equilibrium C approaches C' at the limit. This leads to the conclusion that when taken alone a salary cap in a π-max league will constrain large market teams and improve competitive balance. When a payroll cap is combined with revenue sharing, however, the disincentive to win for both teams negates the cap and the league returns to its original state of imbalance $w_1/w_2 = \sigma$.

A payroll minimum is necessary to create competitive balance in a profit-max league with revenue sharing. If the payroll minimum is set at $MIN_2 = \mu CAP_2(\mu < 1)$ in Fig. 2, league revenue sharing equilibrium would progressively follow the path from B to B' along CAP_1. At B' the league is constrained by $CAP_1 = MIN_2$ at $w_1/w_2 = 1/\mu$ ($w_1 = .600$ for $\mu = .66$ in Fig. 2). With additional sharing the league moves along $MR_1' = MIN_2$ until team 1 payroll falls to the point where both clubs are symmetrically constrained at .500 by the payroll minimum at $MIN_1 = MIN_2$. (CAP_2 and MIN_1 are not shown in Fig. 2).

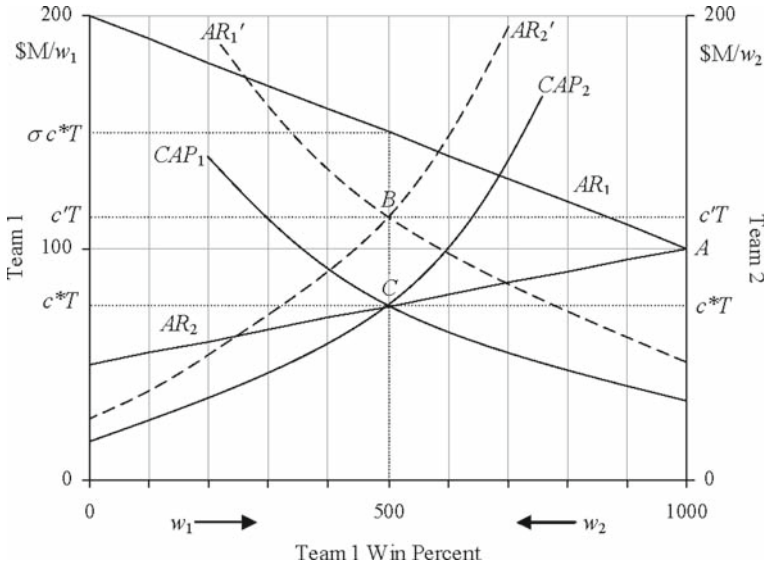

Fig. 3 Payroll Cap and Revenue Sharing in Sportsman League

2.2 Sportsman League

In *sportsman leagues*, team owners are willing to sacrifice profit for winning. At the limit, a *pure sportsman* becomes a win maximizer, constrained by season length and zero profit rather than maximum profit, such that $R_1 = ct_1$ and $R_1/w_1 = ct_1/w_1 = cT$, where $t_1 = w_1 T$. The *sportsman league* win-max solution becomes:

$$AR_1 = AR_2 = cT. \tag{15}$$

This is true whether the talent markets are *open* or *closed*. Substitution of (9) into (15) yields the *pure sportsman* σ-model result:

$$AR_1 = AR_2 = \sigma\,(1 - .5w_1) = (1 - .5w_2) = cT, \tag{16}$$

with less balance than either the open or closed π-max solution: $w_1/w_2 = (2\sigma - 1)/(2-\sigma)$, with win percentages $w_1 = (2\sigma - 1)/(1+\sigma)$ and $w_2 = (2-\sigma)/(1+\sigma)$. Team 1's total win-max dominance of team 2 is shown at A in Fig. 3 for $\sigma = 2$. The bad news for a *win-max league* is self-defeating dominance by the large-market club at A. The good news is competitive balance can be modified by either revenue sharing or a salary cap or both.

2.2.1 Revenue Sharing in Win-Max League

To show that *strong form* invariance does not hold in a win-maximizing league, the pool-sharing formula (12) can be modified for sportsmen so that $AR_1' = AR_2' = c'T$:

$$\alpha R_1/w_1 + (1-\alpha)(R_1+R_2)/2w_1 = \alpha R_2/w_2 + (1-\alpha)(R_1+R_2)/2w_2 = c'T. \tag{17}$$

If there is no revenue sharing ($\alpha = 1$), then the second term vanishes for each team, and $AR_1 = AR_2 = cT$ as in (16). In a pure syndicate ($\alpha = 0$) revenues and payrolls become the same for each team $(R_1 + R_2)/2$, which implies that the league is competitively balanced at $w_1 = w_2 = .500$. A pure sportsman syndicate is shown at B in Fig. 3. In a win-max syndicate league payroll is equal to total revenue, which is divided equally between clubs $c'T/2$. The σ-solution yields pure syndicate revenue and payroll of $c'T = .375(1+\sigma)$ or \$112.5 million for $\sigma = 2$ in Fig. 3. Both clubs have zero profits because all revenue is paid to the players to maximize wins. League payroll increases with revenue sharing toward the league total revenue maximum. Maximum revenue ($\sigma w_2 = w_1$) requires $\alpha = [\sigma^4 + \sigma^3 - (\sigma+1)]/[\sigma^4 + \sigma^3 - (3\sigma+1)]$. So if $\sigma = 2$, then $\alpha = .64$ for maximum revenue in a sportsman league.

2.2.2 Payroll Cap in Win-Max League

To see the equalizing effects of a separate payroll cap in a win-maximizing league reconsider the cap solution from (13) revised for a *sportsman* league $CAP_1 = AR_2 = c^*T$.

$$\lambda(R_1+R_2)/2w_1 = R_2/w_2 = \lambda\left[.5 + \sigma w_1 - .5(\sigma+1)w_1^2\right]/2w_1 = (1-.5w_2). \tag{18}$$

Competitive balance at $w_1 = w_2 = .500$ requires a payroll cap $\lambda = 2/(1+\sigma)$. A payroll cap of $\lambda = .67$ for $\sigma = 2$ is shown in Fig. 3 at C where $CAP_1 = AR_2$. Under the *iso*-payroll cap, payroll for each team is $c^*T/2 = R_1/\sigma = R_2$ at $w_1 = w_2$. Team 1's profit rate is R_1/σ and team 2's profit is zero, because it spends all of its revenue on its payroll. League revenue maximum obtains if the payroll cap set at $\lambda = 4\sigma^2/(1+\sigma)(1+\sigma+\sigma^2)$. If $\sigma = 2$ then $\lambda = .76$ payroll cap yields the revenue maximum ($\sigma w_2 = w_1$) in a sportsman league. The combined implementation of a payroll cap ($\lambda = .67$) and equal revenue sharing ($\alpha = 0$) virtually clones equality in team revenues $c'T/2$ at B, team payrolls $c^*T/2$ at C, and profits $(c' - c^*)T/2$ in Fig. 3. Each team has the same revenue, payroll, and profit, and total payroll is capped at two-thirds of league revenue.

These results lead to opposite conclusions for π-max and win-max leagues: In π-max leagues revenue sharing does not increase competitive balance, but it does increase talent exploitation. Players are paid less than their marginal revenue product by the amount of revenue that is shared. In contrast, win-max leagues initially have

greater competitive imbalance than profit-max leagues, but revenue sharing in sportsman leagues can potentially increase competitive balance and lead to higher revenue and greater payroll toward the league maximum. This is because sportsmen owners pay players their *average revenue product* to maximize wins.

3 North American Sports Leagues

The underlying dynamic of the modern history of American sports leagues is found in the simple duality of the games themselves. Each league has dealt with the balance of competitive individualism versus the league collective in its own way. As recent power conflicts have been resolved, the various collective bargaining solutions are becoming remarkably similar. Internal policy questions center on the impact of revenue sharing and salary controls on competitive balance and monopsony exploitation of talent. Deeper answers lie hidden in the social surplus extracted by local monopoly teams playing in global monopoly leagues. Practical implications of the theory of sports leagues can be seen through a comparative analysis of the four major North American sports leagues' operating regimes as they have evolved in Table 1.

3.1 National Football League

The solidarity of the National Football League (NFL) was forged in the heat of the epic war with the American Football League that began in 1960. By the time the NFL-AFL peace agreement was reached in 1966, the powerful super-league had rescued its monopsony power from the erosive forces of rival-league competition. Following the twenty-six team merger of 1970 (16 NFL clubs and 10 AFL clubs) the NFL added two clubs in 1976, two more in 1995, and one team each in 1999 and 2002. Empowered with a legalized monopoly broadcasting cartel in 1961 and relocation extortion threats for public subsidy of venues after 1982, the NFL has emerged as the most competitively balanced, and most economically powerful sports league in the world. Total NFL revenues were $6.4 billion in 2006 and estimated at over $7 billion in 2007.[4]

After the 2002 expansion and realignment, 32 NFL clubs were organized into eight divisions of four teams. The regular NFL season lasts 16 games, and the top 12 teams (eight division leaders with four first-round byes and four wild-card teams) qualify for a four-round knock-out championship tournament. In the thirteen seasons since the 1993 Collective Bargaining Agreement (CBA) and the hard salary cap in 1994, ten different clubs (eight of last ten) have been Super Bowl Champions. As a result of relatively few home games (season tickets are for eight regular season and two preseason games), NFL attendance is inelastic with respect to both ticket price and team quality. This low revenue risk/variance is reflected in the 4.7 value/revenue multiple used by *Forbes*. The average NFL club in 2006 was valued by *Forbes* at $957 million on revenues of $204 million. Club-specific risk is diversified by extensive revenue-shar-

[4] NFL revenues were double those of the English Premier League (EPL), which were $2.67 billion in 2006 and $3.36 billion in 2007–08.

Table 1 North American Sports League Operating Rules

League	NFL	MLB	NBA	NHL
Size/Season	32 teams, 8 divisions, 16 games.	30 teams, 6 divisions, 162 games.	30 teams, 6 divisions, 82 games.	30 teams, 6 divisions, 82 games.
Playoffs	4 rounds, 12 teams (4 byes)	3 rounds, 8 teams 2 wild cards	4 rounds, 16 teams	4 rounds, 16 teams
Roster size	45 active / 53 total	25 active / 40 total	12 active / 15 total	20 active / 23 total
Bargaining Agreement	*Six years* 2006–11. NFLPA is weak: decertified before 1993 free agency.	*Five years:* 2007–11. MLBPA is strong: 2002 CBA was first without stoppage	*Six years:* 2005–11 NBA option year. 1998–99 lock-out only work stoppage	*Six years:* 2005–11, NHLPA option. Lock-out cancelled 2004–05 season
Free Agency Conditions	*Unrestricted* free agency after 4 years. *Restricted* after 3 years	*Unrestricted* free agency after 6 years. A*rbitration* 3–5 years	*Unrestricted* after 1st contract with first refusal rights to team.	*Unrestricted* age 27 after 4 years NHL.*Restricted* under age 27 after 2008.
Mean Salary	$1.40 M in 2007 from $395 K in 1990.	$2.95 M in 2007 from $579 K in 1990.	$5.22 M in 2007 from $717 K in 1990.	$1.77 M in 2007 from $221 K in 1990.
Payroll Cap/Luxury Tax	*Hard cap since 1994*: 57–58% of TR (2006–11); $109 M (2007); $116 M (2008); 59–60% failsafe trigger cap. Minimum payroll 84–90% of cap	*Luxury tax (CBT):* 22.5% of payroll over $148M (2007), $155 M (2008), $162 M (2009), $170 M (2010), $178 M (2011); 30%–40% for 2nd–3rd breach	*Soft cap 1983–84*: 57% of basketball related income BRI. 2008 cap $55.6M, minimum 75% of cap. *Luxury tax* on payroll above 61% BRI: $68 M in 2008	*Hard cap 2005:* 57% of hockey related revenue HRR. Cap $44 M in 2007; $50.3 M in 2008. Minimum of payroll range $16 M below cap
Local Revenue	Gate 20% of total and shared 66/34. Venue 20% unshared. Local media is insignificant.	Gate 39%, venue 23%, local media 16% of total revenue. 31% of local revenue shared.	Gate 33% of total revenue. Local revenue is not shared.	Gate 52%, venue 25%, media 20% of total. 4.5% of local revenue is shared.
Central Revenue	National media 60% of total, shared equally. Six-year deal 2006–11, FOX,ABC/ESPN, CBS: $116.7 M per club.	National media 17% of total, shared equally. Seven-year deal 2007–13 FOX, TBS and ESPN: $26.8 M per club.	National media 25% of total, shared equally. Six-year deal 2008–16 TNT and ABC/ESPN: $31 M per club.	National media 6% of total, shared equally. Six-year deal 2005–11 VS; CBC/TSN (Canada): $5 M per club.
Forbes' Mean Team Value	V/R = $957 M / $204 M = 4.7 2006 league revenue $6.36 billion	V/R = $431 M / $170 M = 2.5 2006 league revenue $5.11 billion	V/R = $372 M / $119 M = 3.1 2006–07 league revenue $3.57 billion	V/R = $200 M / $81 M = 2.5 2006–07 league revenue $2.44 billion

ing arrangements that have characterized NFL "league-think" since its reinvention in 1960.

NFL national television annual rights have exploded eighty-fold since the 1970 merger and the League will take in an average of $3.7 billion annually 2006–11. These collectively negotiated fees are 60 percent of total revenue and are shared equally among NFL clubs (NFL local media revenue is insignificant). Gate revenue is about 20 percent of NFL total revenue, and it is shared 66/34 (60/40 after a standard 15 percent deduction for game expenses) in a straight-pool home/visitor formula with the league (equal visitor shares began after the 2002 realignment). The merging importance of unshared venue revenue from luxury seats has recently become a chink in NFL solidarity armor. Club seats and luxury suites have driven the venue revolution over the last two decades in all leagues, and un-shared venue revenue has doubled from ten to twenty percent of total NFL revenue.

While the venue revolution increases revenues of individual clubs, the national media explosion solidifies the egalitarian league collective. All told, a full two-thirds of NFL revenue is pooled and shared equally among the clubs. Important in guaranteeing a low-risk of negative cash flow is the league-wide payroll cap imposed on NFL players since 1994. After decertification and legal victory, the NFLPA bargained successfully for free agency in 1993, but it came in exchange for a league-wide hard salary cap at 64 percent of defined gross revenues (DGR). Unshared luxury seat money from the ongoing venue revolution created two revenue asymmetry problems in the 2006 CBA. The NFLPA had a problem with hidden luxury seat money being excluded from DGR, and teams playing in older venues complained about the growing disparity of unshared luxury-seat revenues.

As a compromise the 2006 CBA expanded the revenue-sharing base beyond DGR, and the salary cap percentage was reduced to 59.5 percent of total football revenue.[5] The payroll cap was set at $102 million in 2006 (compared to $94.5 million under the previous DGR formula), $109 million in 2007, and $116 million in 2008. The NFL cap also has a minimum payroll that progresses in 1.2 percent increments from 84 percent to 90 percent of the cap over the course of the 2006–11 CBA. Given this cash flow certainty, the NFL has become a fully diversified money machine. Unfortunately much of NFL value is extracted through monopoly power over an increasingly exclusive fan-base and venue extortion power over the general tax-paying public.

3.2 Major League Baseball

The dual monopoly that characterized professional baseball for most of the 20th Century was formed in the National and American League rival wars 1900–03 that ended

[5] The cap in the 2006 CBA was set at $102 million (2006), $109 million (2007), 57.5 percent of total revenues in 2008–09, and 58 percent in 2010–2011. The fail-safe trigger adjustment rate is set at 2 percentage points higher: 59 percent (2006–07), 59.5 percent (2008–09), and 60 percent (2010–11). The minimum payroll ratio increases by 1.2 percentage points each year from 84 percent of the cap in 2006 to 90 percent of the cap in 2011. The top 15 revenue clubs agreed to share $430 million 2006–09 with clubs in older venues whose payroll exceeds 65 percent their revenue and their gate revenue is at least 90 percent of the league average.

in an AL-NL peace settlement of 1903. As separate but equal eight-team monopoly-monopsony leagues, the AL and NL enjoyed remarkable stability for fifty years until a series of post-war dual market relocations in the 1950's. The 1950s relocation derby was followed by four pre-emptive expansions in 1960–61 to avert the threat of a third rival league.[6] The two ten-team leagues subsequently behaved as rival leagues until the 1980's, each with two expansions in 1969 and one in 1977. By the time of the next two-team NL expansion in 1993, divisive AL-NL distinctions had been gradually replaced by a collective MLB owner strategy.[7] MLB adopted a six-division wild-card format in 1994, but play-offs and the World Series were cancelled because of the 1994–95 player strike.

When the last two expansion clubs were added in 1998, MLB was financially unified into a 30-team league with six divisions (AL 14 clubs and NL 16 clubs). The MLB schedule is set for 162 games, and eight teams (three division champions and a wild-card team from each league) qualify for three-round playoffs. In spite of chronic local revenue disparity among MLB clubs, the random element introduced by this divisional play-off format has produced parity in the post-season since the 1994–95 strike. In the thirteen seasons of six-division play (1995–2007) eight different teams have won the World Series, and four of those were wild-card teams.

The two CBAs that followed the 1996 peace accord in 2002 and 2006 were the first deals reached without work stoppage in the history of the MLBPA. Since the 2002 CBA, MLB and MLBPA adversaries have embarked on a new wave of shared prosperity. MLB reported total revenues of $6.075 billion for 2007, up from $5.58 billion in 2006. In 2006 MLB's $935 million national television rights were 16.8 percent of the total. MLB national television is roughly equal to total local television at 15 percent of total revenue in 2006. Total national revenue of $1.598 million in 2006 was 28.6 percent of MLB revenue compared to 20.3 percent in 2001, while gate revenues fell to 35 percent in 2006 from 40 percent five years earlier.[8] This MLB revenue solidarity is due in large part to a ten-fold explosion in MLB Advanced Media (BAM) to $317 million in 2006 from its start-up stream of $36 million in 2001. Projected MLB.com revenue of $380 million has been kicked up to $450 million for 2007.[9] On the national level MLB new broadband media is approaching one-half of MLB old TV media. MLB.com new media money exceeded MLB merchandising and licens-

[6] The Continental League was formed in 1959 by William Shea to bring the National League back to New York after relocations of the Brooklyn Dodgers to Los Angeles and the New York Giants to San Francisco in 1958. The league had members in New York, Houston, Denver, Minneapolis, Denver and Toronto, with proposed sites in Atlanta, Dallas and Buffalo. The CL disbanded after NL expansions into New York (Mets) and Houston (Colt 45s) in 1962.

[7] MLB owners were fined $280 million for collusion against free agent signings after the 1986–89 seasons. Fees of $190 million from NL Colorado Rockies and Florida Marlins expansion in 1993 were shared with the AL, which also provided players in an expansion draft ($42 million to 14 AL clubs and $148 million to12 NL clubs).

[8] MLB's Blue Ribbon Panel reported that national revenue was 20 percent of total annual revenue in 1996–2001.

[9] MLB.com annual revenues since launched in 2000 have been $36 million (2001), $50 million (2002), $91 million (2003), $140 million (2004), $236 million (2005), $317 million (2006), and $380-$450 million (2007).

ing revenue of $312 million in 2006, and surpassed MLB total revenue sharing of $326 million in 2006, and $342 million in 2007.

MLB local revenue sharing was introduced in the 1996 CBA with a 20 percent local revenue share allocated under a split pool plan.[10] In the 2002 CBA revenue sharing contribution increased to 34 percent of local revenue and was divided equally among all teams (straight pool). The 2006 CBA reduced the shared portion of local revenue to 31 percent that is straight pooled among the clubs.[11] Given the strong adversarial position of MLBPA, MLB has implemented a luxury tax rather than a hard team-salary cap in each CBA after the 1994–95 strike. The "competitive balance tax" (CBT) is a tax on team payrolls over a threshold set so high that the tax is essentially a New York Yankee tax.[12] The Yankees have been taxed each year 2003–07 of the CBT and have paid a total of $121.6 million 2003–07 of the total CBT of $136.4 million.[13]

The 81-game home schedule in MLB introduces considerable variance in attendance and high demand elasticity with respect to team quality. The average MLB club has an estimated value of $431 million on revenues of $170 million in 2006. This is less than one-half that of the average NFL club, based on the MLB risk adjusted revenue multiple of 2.5 compared to an NFL multiple of 4.7. Even if MLB matched the NFL in revenue, MLB clubs would be worth about half as much because of player cost and revenue uncertainty. If 31 percent of local revenue is shared after ballpark expense deductions, then the recent surge of national revenue to 28.6 percent would bring the total amount of MLB revenue that is shared to about 40 percent.

3.3 National Basketball Association

The rebirth of the National Basketball Association (NBA) coincides with a "revolutionary partnership" that imposed a league-wide team salary cap beginning in 1984–85. The rival league war (1969–76) between the NBA and the American Basketball Association (ABA) ended with the merger of four ABA teams in 1977.[14] During the

[10] "Each Club contributes 20% of its Net Local Revenue to a putative pool; 75% of that pool is divided equally among all Clubs; the remaining 25% of the pool is divided only among Participating Clubs below the arithmetic mean of Net Local Revenue in proportion to each such Club's distance from said average." *1996 CBA* XV A(9).

[11] MLB annual revenue sharing transfers: $166 million (2001), $169 million (2002), $220 million (2003), $247 million (2004), $312 million (2005), $326 million (2006), and $342 million (2007).

[12] CBT annual thresholds: $117 million (2003), $120.5 million (2004), $128 million (2005), $136.5 million (2006), $148 million (2007), $155 million (2008), $162 million (2009), $170 million (2010). Luxury tax under the 1996 CBA had a floating threshold between the revenues of the 5th and 6th highest payroll clubs: $51 million (1997), $55 million (1998), and $58.9 million (1999), with tax rates of 34–35 percent.

[13] Competitive balance taxes are in addition to NY Yankees' annual revenue sharing payments of $52.65 million (2003), $63 million (2004), $76 million (2005), and $78.7 million (2006). CBT total 2003–07: $136.4 million. Yankees' annual CBT payments: $11.8 million (2003), $26 million (2004), $34 million (2005), $26 million (2006), and $23.9 million (2007), for a total $121.6 million. Red Sox' annual CBT payments: $3.1 million (2004), $4.1 million (2005), $500,000 (2006), and $6.1 million (2007), for a total $13.9 million.

[14] The NBA-ABA merger stalled in 1970 in *Robertson v. National Basketball Association*, 389 F. Supp. 867, 890–96 (S.D.N.Y. 1975) and then cleared in the out-of-court Robertson Settlement in 1976 with the NBPA, in which the right of first refusal was given to the original team. Merger with the ABA (the

NBA-ABA war NBA player salaries had grown to about 70 percent of league revenues. During the 1979–80 rookie seasons of the Boston Celtics' Larry Bird and the Los Angeles Lakers' Magic Johnson, the NBA reported $13 million losses and openly considered contraction of five clubs. By 1983 CBA negotiations player costs had reached three-fourths of league revenues, and the National Basketball Players Association (NBPA) agreed to cap team payrolls at 53 percent of revenues. In an attempt to keep star players with their original clubs, the NBA granted the "Larry Bird" exception for clubs to exceed the "soft cap" to re-sign their own free agents.[15] Optimal competitive balance is an empirical question, and the soft payroll cap revealed the NBA's clear preference for dynasties on national TV.

The NBA-NBPA partnership showed signs of strain by the 1990's. NBA owners wanted to remove the Bird exception and impose a hard salary cap. When player salaries reached 57.2 percent of $1.7 billion basketball-related income (BRI) in 1998, NBA owners reopened the 1995 CBA.[16] In the 1999 CBA the owners retained the soft cap but were able to resurrect a luxury tax proposal it had withdrawn from the table in 1995. As conceived in the 2005 CBA the NBA luxury tax is more restrictive on spending than the ineffective MLB version. The NBA luxury tax withheld a 10 percent escrow fund of player salaries to insure that salaries and benefits did not exceed a designated percentage of BRI rising from 55 percent 2001–02 to 57 percent in 2006–07. If escrow payments exceeded the designated percent of BRI, then the overage is refunded to the players. If the escrow payments fall short, then the difference is made up by a 100 percent tax for higher spending clubs on payroll over the tax threshold.[17] As the salary cap/escrow-tax system has since evolved, the luxury tax has emerged as a de facto hard salary cap in the NBA.[18]

In 2004 the NBA expanded to 30 teams, playing 82-game seasons in six divisions. The top eight teams in Eastern and Western Conferences each qualify for the first of four rounds of play-offs. The NBA post-season tournament is the least competitive of all four American leagues. Five teams have won the last ten NBA champi-

Footnote 14 continued
Denver Nuggets, Indiana Pacers, New York Nets, and San Antonio Spurs each paid a $3.2 million entry fee) increased the number of NBA franchises to 22 in 1977.

15 In the first season of the cap (1983–84) five clubs were frozen over the $3.6 million cap: LA Lakers $5.2 million, NY Knicks $4.6 million, Seattle Supersonics $4.6 million, Philadelphia 76ers $4.45 million, and New Jersey Nets $3.75 million. In the following 1984–85 season the Boston Celtics used their own free agent cap exception to sign Larry Bird to a seven-year contract for $14 million (previously a $3.25 million five-year deal 1979–84.)

16 The 1995 CBA was reopened in 1997–98 when salaries reached 57.2% of $1.7 billion BRI. The lockout was the first work stoppage in the history of the NBA. More than half of the clubs were over the $26.9 million cap in 1997–98. The Chicago Bulls re-signed Michael Jordan to a contract of $33 million (itself larger than the team cap) with the Larry Bird exception for the highest team payroll of $61.3 million in 1997–98.

17 In 2001–05 the individual team tax was triggered if the league salary percentage went above the threshold of 61.1 percent. If the league salary ratio was under the threshold there was no tax in the 1999 CBA, even if an individual team was over the threshold. The tax was triggered for 2002–03 and 2003–04, but there was no tax in 2001–02 and 2004–05. After the 2005 CBA both the escrow system and luxury tax are in effect.

18 The salary cap and luxury tax threshold are determined prior to the season. The salary cap is computed by taking 51 percent (luxury tax 61 percent) of projected BRI, subtracting projected benefits ($112 million 2005–06), adjusting for previous season's BRI above or below projections, and dividing by the number of teams. BRI is projected from contractual TV money plus eight percent growth in non-TV BRI revenue.

onships, and only seven teams have won the NBA title in the quarter century of the salary cap era. Given the 41-game home season there is considerable gate-revenue risk for the isolated club, even though gate revenues league-wide are consistently one-third of total revenue. Shared national TV money is about 25 percent of total NBA revenues, which reached $3.57 billion in 2006–07. The *Forbes* revenue multiple 3.1 reflects significant revenue risk for the local club modified with moderate cost certainty from the salary cap. The average NBA club in 2007 was valued by *Forbes* at $372 million on revenues of $119 million. About 25 percent of NBA revenue is shared evenly.

3.4 National Hockey League

Canadian hockey fans mourn the death of "old-time hockey" in a watershed event simply called "The Trade." For better or worse, the eight-player deal involving the trade of Wayne Gretzky ("The Great One") from the Edmonton Oilers to the Los Angeles Kings for $15 million in 1988 also marks the birth of a new era in the NHL.[19] The trade altered the economics of hockey in two ways that would ultimately lead to the cancellation of the 2004–05 season. After Gretzky's move to large-market L.A. his salary was twice doubled from $1.72 million to $3 million in 1990 and to $6.5 million in 1995. The small-market Pittsburgh Penguins answered in 1991 by giving Mario Lemieux (the next most prolific NHL scorer) $7 million annually for six-years. The Penguins won the Stanley Cup in 1991 and 1992 and had the highest payrolls in 1994–95, 1995–96, and 1996–97. After reporting losses of $20 million in 1995 and $13 million in 1996, the Penguins filed for bankruptcy in 1998.[20] NHL payrolls increased from 30 percent to 40 percent of league revenues from 1990 to 1993, and by 1996 one-half of NHL revenues was going to the players.

The Gretzky tour in Southern California also sparked NHL interest in expansion and relocation to non-traditional U.S. hockey markets to strengthen television revenues.[21] The ill-fated "Sunbelt strategy" added nine teams in nine years (1991–2000), and the NHL became a bloated 30-team league with six five-team divisions.[22] Unfortunately, NHL owners had cannibalized their own league in the process by taking

[19] Gretzky, considered the greatest hockey player of all time, was traded to St. Louis and finished his career with the New York Rangers in 1999. The Edmonton Oilers won four Stanley Cups in five years before the trade. The Oilers were one of four rival league World Hockey Association (WHA 1972–79) clubs to merge with the NHL in 1979–80: Edmonton Oilers, Winnipeg Jets, Quebec Nordiques, and New England Whalers.

[20] As the largest creditor Lemieux exchanged $20 million of his $32.6 million deferred compensation for 20 percent equity position as general partner.

[21] The NHL added five teams in three years: San Jose Sharks (1991), Ottawa Senators and Tampa Lightning (1992), and Anaheim Ducks and Florida Panthers (1993) all with an expansion fee of $50 million. Four teams were selected in 1997 for expansion with fees of $80 million each: Nashville Predators (1998), Atlanta Thrashers (1999), and the Columbus Blue Jackets (2000) and Minnesota Wild (2000), for a 30-team total.

[22] The Sun-Belt strategy involved relocations of four clubs, including three WHA teams: The Minnesota North Stars became the Dallas Stars in 1993; the Quebec Nordiques moved to Colorado Avalanche in 1995; the Winnipeg Jets relocated to Phoenix Coyotes in 1996; and the Hartford Whalers moved to Carolina Hurricanes in 1997.

one-time expansion fees from marginal-market clubs that increased competition for diluted hockey talent. As an afterthought of the 1997 decision to expand the NHL by four teams in 1998–2000 and collect $320 million more in fees, the CBA was extended four years until 2004.

By the 2004 CBA negotiations the easy $570 million in NHL expansion fees was long gone. ESPN/ABC declined its option to extend $120 million annual rights fees beyond 2004 because of declining ratings and labor uncertainty. According to the NHL, the revenue growth of 164 percent over the ten years of the expiring CBA was exhausted by a 254 percent increase in player salaries. By the owners' own accounting, the players' share of revenues had ballooned from 57 percent in 1993–94 to 75 percent in 2002–03. NHL owners declared that the NHL economic model was broken and that a hard salary cap was the only solution. The NHLPA responded that NHL revenues were understated and questioned why owners needed a hard salary cap when the NHL had the most restrictive "unrestricted" free agency of any league. When the NHLPA rejected the salary cap, owners called a lockout and cancelled the 2004–05 season.

The issues of the CBA were resolved in 2005, and the economic future of the NHL has been framed in revolutionary changes made in the agreement. The six-year deal that runs through 2011 specified a hard salary cap that limits the players' share to 57 percent for revenues above $2.7 million. Existing player contracts were rolled back by 24 percent to lower the player-share from 75 percent to 57 percent. The payroll cap was set at $39 million in 2005–06, $44 million in 2006–07, and $50.3 million in 2007–08. Minimum team payroll is arbitrarily set at $16 million below the cap ($34.3 million in 2007–08).[23] No individual player can have a contract salary over 20 percent of the cap, so the individual NHL player salary limit was $7.8 million in 2005–06, $8.8 million in 2006–07, and $10.06 million for 2007–08. A player's eligibility for unrestricted free agency was reduced from 31 to 29 years of age in 2006–07 and to 27 years after 2008–09. The CBA also has a modest "Player Compensation Cost Redistribution System" that transfers revenue from the top-ten richest clubs to the bottom 15 clubs to subsidize the league minimum payroll.[24]

Post-lockout NHL revenues were much stronger than projected by the league, and attendance in traditional hockey markets was resilient. The league reported hockey related revenue (HRR) of $2.178 billion in 2005–06 and $2.318 billion in 2006–07, compared to $2.083 billion in 2003–04 before the lockout. Player costs of $1.325 billion were 57.2 percent of HRR and 54.4 percent of gross NHL revenues of $2.436 billion

[23] The "Team Payroll Range System" is a $16 million range around an adjusted midpoint. Given 2006–07 HRR of $2.318 billion and annual benefits of $80 million, the applicable percentage of 55.59 percent yields the midpoint = [(55.59 % of $2,318 million)–$80 million]/30 clubs = $40.286 million. The adjusted midpoint for 2007–08 is projected by a 5 percent growth rate to $42.3 million. The 2007–08 payroll cap of $50.3 million and minimum of $34.3 are $8 million above and $8 million below the $42.3 million adjusted midpoint.

[24] Eligible recipients must be in the bottom 15 revenue clubs and play in home media markets with fewer than 2.5 million TV households. This excludes the top 5 NHL 2007–08 Designated Market Areas (DMAs) according to Nielsen Media. Eleven American clubs (seven Sunbelt teams) qualified for total payments of $98 million in 2005–06 and $104 million in 2006–07. The minimum commitment of the top ten clubs is 4.5 percent of HRR.

for 2006–07. *Forbes* valued the average NHL club at $200 million on revenues of $81 million in 2006–07. The NHL revenue multiple of 2.5 is the same as MLB and reflects significant team-specific and league-specific revenue risk modified by salary cap cost certainty. The cost redistribution plan together with a meager national TV contract brings NHL revenue sharing to only about 16 percent. In spite of local revenue disparity the NHL has shown moderate competitive balance on the post-season ice. Six different clubs have won the last ten Stanley Cups, compared to five of ten NBA Champions, seven of ten MLB Champions, and eight of the last ten NFL Super Bowl winners.

4 Monopsony Power

4.1 National Football League

Since the AFL-NFL merger in 1970 the NFL has held the greatest monopsony power of the four leagues. NFL players gained unrestricted free agency in 1994, but only after the NFL Players Association (NFLPA) decertified as a union, sued the NFL in *McNeil et al. v. NFL*. 790 F. Supp. 871 (8th Cir. 1992) and agreed to a hard salary cap.[25] The only external threat to NFL monopsony power occurred during the rival league war 1983–85 with the USFL, when the average NFL salary doubled from $120,000 in 1982 to $245,000 in 1985 (26.9 percent compound annual growth rate, or CAGR). The NFL salary growth was followed immediately by the financial collapse of the USFL, two seasons of zero salary growth for players, a failed NFLPA strike in 1987, and a five-year CBA impasse through 1992. The average NFL salary grew 15.3 percent CAGR from $23,000 at the time of the AFL-NFL merger in 1970 to $395,000 in 1990. As a result the NFL player cost-share was relatively constant at 39 percent of $192 million revenues in 1975, and 41 percent of $1.314 billion NFL revenues in 1990.

Given the symbiotic relationship of television and the NFL, new contracts for rights fees are usually associated with player salary increases. For example, the doubling of salaries during the USFL war 1983–85 was fueled by a 160 percent increase in annual average TV rights fees 1982–86. More recently the doubling of TV rights in 1990–93 worked with NFLPA free agency to create an explosion in the average salary of 38 percent and a rapid rise of the players' cost share from 41 percent in 1990 to 64 percent in 1993, the last uncapped season in the NFL. As shown in Table 2, NFL player salaries jumped with each new TV deal, and remained relatively stable until the next contract. This occurs because the salary cap, payroll minimum, and guarantee were tied directly to projected DGR 1994–2006. The NFL player payroll share around 60 percent of revenue since 1993 is consistent with owner objectives of win maximization. Evidence of monopsony power erosion from internal competition among owners

[25] After a 1987 bargaining impasse over unrestricted free agency, the NFLPA decertified in 1989 to remove owners' labor-law antitrust exemption. The NFL's Plan B restricted free agency system, where a team could protect 37 of 47 roster players, was rendered illegal in *McNeil*.

in a revenue sharing league suggests that the NFL has become a league dominated by win-maximizing sportsmen.

4.2 Major League Baseball

Compared to other sports leagues, MLB monopsony power is uniquely buffered against rival leagues because MLB preemptively controls all potential markets through its affiliated minor league player development system. As the strongest sports union, the MLBPA was the first union to obtain unrestricted free agency in the CBA of 1976. Based on competition for free agents from within the league, rather than from external rivals, average MLB salaries doubled in the first two years of free agency and quadrupled in the first decade from $51,500 in 1976 to $412,500 in 1986 (23.1 percent CAGR). This rapid salary growth was followed by collusion of MLB owners after the 1985–87 seasons.[26] Salaries stagnated at 2.1 percent CAGR during the collusion, but post-collusion player salaries doubled from an average of $497,300 in 1989 to $1 million in 1992 (Table 2).

In the first five years of free agency the players' share of MLB revenue doubled from 20.5 percent of $231 million in 1977 to 41.1 percent of $421.8 million in 1982. During the collusion the players' share dropped from 40 percent of $791.9 million in 1986 to 31.6 percent of $1.241 billion in 1989. After the salary explosion in the post-collusion period the players' share almost doubled to 57.8 percent of $1.585 billion revenue by 1992.[27] This player-cost squeeze resulted directly in the season-cancelling MLB strike of 1994–95.[28] After the strike MLB players' share grew to two-thirds of $3.65 billion revenue by 2002. Since 2002 MLB salaries slowed to negative growth in 2004, and the player cost share dropped to 55 percent of $5.1 billion by 2006.[29] With payroll shares in the 60 percent range, the 2002 and 2006 CBAs became the first deals reached without work stoppage. This evidence suggests that MLB and MLBPA have been cooperating in negotiations for mutual gain and that since 1990 MLB has been dominated by sportsman owners.

4.3 National Basketball Association

The monopsony power of the NBA has been historically the weakest of the four leagues, and the NBA and NBPA have enjoyed the most cooperative bargaining relationship. The only outside threat to NBA monopsony power came during the ABA

[26] MLB owners were fined $280 million in arbitration for collusion against free agents after 1985–87 seasons.

[27] In Congressional hearings after the 2001 season MLB reported operating losses of $232 million ($519 million after interest) with player costs of $2.141 billion comprising a 60.3 percent share of $3.548 billion revenues.

[28] After the 1993 season MLB owners proposed a 50–50 split with players and elimination of salary arbitration and reduction of the free agency eligibility to four years instead of six, as proposed in Vrooman (1996).

[29] After the 2002 and 2003 seasons, the MLBPA alleged that owners engaged in collusion. As part of the 2006 CBA, owners agreed to pay players $12 million from luxury taxes with no admission of guilt.

Table 2 Player Costs in NFL and MLB

	National Football League					Major League Baseball				
Year	League Revenue	Player Costs	Player Percent	Mean Salary	Percent Change	League Revenue	Player Costs	Player Percent	Mean Salary	Percent Change
1990	1,314†	539	41.0	395	15.1	1,348†	450	33.4	598	20.2
1991	1,469	693	47.2	463	17.0	1,504	681	45.3	851	42.5
1992	1,491	893	59.9	484	4.6	1,585	916	57.8	1,029	20.8
1993	1,753	1,129	64.4	666	37.7	1,775**	1,005	56.6	1,076	4.6
1994	1,730†	1,110	64.2	628	−5.7	1,132†	717	63.4	1,168	8.6
1995	2,059**	1,399	68.0	717	14.1	1,385	927	66.9	1,111	−4.9
1996	2,235	1,372	61.4	788	9.9	1,775†	939	52.9	1,120	0.8
1997	2,382	1,402	58.9	737	−6.5	2,067	1,117	54.0	1,337	19.3
1998	3,183†	1,770	56.4	993	34.7	2,479**	1,272	51.3	1,399	4.7
1999	3,423*	2,040	59.6	1,056	6.4	2,787	1,490	53.5	1,611	15.2
2000	3,938	2,414	61.3	1,116	5.7	3,178	1,847	58.1	1,896	17.7
2001	4,284	2,383	55.6	1,101	−1.4	3,548†	2,141	60.3	2,139	12.8
2002	4,944*	2,497	50.5	1,316	19.6	3,652	2,455	67.2	2,296	7.3
2003	5,330	2,931	55.0	1,259	−4.3	3,878	2,540	65.5	2,372	3.3
2004	6,029	3,169	52.6	1,331	5.7	4,269	2,514	58.9	2,314	−2.5
2005	6,160	3,269	53.1	1,396	4.9	4,733	2,702	57.1	2,477	7.0
2006	6, 359†	4,015	61.4	1,630	16.8	5,111	2,799	54.8	2,699	9.0

Revenues and player costs $ millions, average player salaries $ thousands. Player costs include benefits and bonuses
Source: *Forbes*, NFLPA and MLBPA and MLB Blue Ribbon Commission
† New TV rights fees
* Expansion teams

rival league war 1967–76. During the ABA war NBA average salaries increased at 20.6 percent CAGR from $35,000 in 1970 to $130,000 in 1977. This resulted in an increase in the players' share of league revenue from 46.1 percent in 1971 to over two-thirds by 1977. The salary cap in 1984–85 was billed as a "revolutionary partnership." While it constrains competitive salary growth, it also guarantees the players a fixed revenue share. In the first decade of the cap average player salary increased from $275,000 in 1984 to $1.8 million in 1995 at 20.7 CAGR, the same growth rate that occurred under the threat of the ABA.

Increases in NBA salary growth have also coincided with each TV contract because costs and revenues are linked through the payroll cap. This was particularly true for windfall TV contracts of 1982–86, 1990–94, and 1998–2002. A 20-year string of double-digit NBA salary growth came to an abrupt end in 2001–02, the last year of the NBA on NBC and the first year of the straight luxury tax system. As shown in Table 3, average salaries stalled at less than 4 percent CAGR from $4.2 million in 2000–01 to $5.2 million in 2006–07 because of a leveling of TV revenues 2002–08 and the luxury tax. Player cost as a share of NBA revenues increased from 40.6 percent of $600 million in 1989–90 to 60 percent of $2.3 billion after the 1998–99 lockout and 57.7 percent of $3.57 billion in 2006–07. The NBA cap was originally designed to protect owners against themselves, rather than the players. As the cap-guarantee has evolved it has also forced sportsman owners to share expanding external monopoly revenue with the players.

4.4 National Hockey League

The NHL is by far the most provincial league, and the NHLPA has been historically the weakest union. The NHL reluctantly expanded late in the game and created ideal conditions for the World Hockey Association (WHA) rival league war 1972–78. The NHL added a complete Western Division of six American clubs to the *original six* in 1967, and then quickly added six more clubs in six years 1970–74 to gain a U.S. television presence and pre-empt the WHA. Over the course of the WHA war, average NHL salaries increased 22.9 percent CAGR from $25,000 in 1971 to $86,000 in 1977. After the WHA-NHL, merger player salaries only increased 6.3 percent CAGR for the next decade from $96,000 in 1977–78 to $188,000 at the time of the Gretzky trade (1988–89).[30] During the Sunbelt expansion single digit salary growth was replaced by 21.2 percent CAGR over the NHL's roaring 1990's, and the average salary hit $1.289 million in 1998–99. As shown in Table 3 the players' share doubled from 30 percent of revenue in 1990 to 61 percent by 2000–01. According to NHL owners, player costs consumed three fourths of revenues before the 2004–05 lockout.

[30] The NHL players' share grew from 21.3 percent of revenues at the beginning of the WHA war to 30 percent of revenues in 1990. At the time of the NFL-AFL merger in 1970 the NFL and NBA players were already receiving 40 percent, while MLB and NHL player shares were around 20 percent. In 1990, NHL and MLB players were paid about 30 percent of league revenues, while NFL and NBA players received about 40 percent.

Table 3 Player Costs in NBA and NHL

Season	National Basketball Association					National Hockey League				
	League Revenue	Player Costs	Player Percent	Mean Salary	Percent Change	League Revenue	Player Costs	Player Percent	Mean Salary	Percent Change
1989–90	606**	246	40.6	717	24.7	465	139	29.9	221	17.3
1990–91	843†	331	39.2	927	29.3	518	169	32.6	271	22.8
1991–92	1,000	436	43.6	1,100	18.7	575*	224	38.9	368	35.8
1992–93	1,050	509	48.5	1,300	18.2	694†**	284	41.0	467	26.9
1993–94	1,259	521	41.4	1,500	15.4	817**	337	41.2	572	22.5
1994–95	1,403†	647	46.1	1,800	20.0	728†	277	38.1	733	28.1
1995–96	1,664**	781	46.9	2,000	11.1	1,099	563	51.2	892	21.7
1996–97	1,874	827	44.1	2,300	15.0	1,336	623	54.8	984	10.3
1997–98	1,836	995	54.2	2,640	14.8	1,356	697	58.4	1,168	18.7
1998–99	1,220†	720	59.0	3,000	13.6	1,427†*	802	56.2	1,289	10.4
1999–00	2,316	1,381	59.6	3,620	20.7	1,697*	968	57.0	1,356	5.2
2000–01	2,496	1,551	62.1	4,200	16.0	1,906**	1,093	57.3	1,435	5.8
2001–02	2,664	1,524	57.2	4,500	7.1	2,077	1,270	61.0	1,643	14.5
2002–03	2,721†	1,697	62.4	4,546	1.0	2,094	1,389	66.3	1,790	9.0
2003–04	2,932	1,728	58.9	4,917	8.2	2,238	1,477	66.0	1,830	2.2
2004–05	3,185*	1,842	57.8	4,900	−0.3	Lockout season				
2005–06	3,367	1,985	59.0	5,000	2.0	2,267†	1,211	53.4	1,460	−20.2
2006–07	3,573	2,061	57.7	5,215	4.3	2,436	1,325	54.4	1,770	21.2

Revenues and player costs $ millions, average player salaries $ thousands. Player costs include benefits and bonuses

† New TV rights contract

* Expansion teams

Source: *Forbes*

4.5 Implications

Clear evidence that the players' share has approached two-thirds of revenue in all four major sports leagues leads to the surprising conclusion that monopsony power in all leagues has virtually vanished. There are several explanations, ranging from new-found bargaining power of free-agent players to external competition of rival leagues. The most plausible argument is that league-cartel solidarity has been compromised by internal competition from the profit-max (Nash) behavior of individual owners or by win-max objectives of sportsman owners. Over time a pure-sportsman league is the steady state, in which profit max owners can either change their objectives or be driven from the league (Vrooman 1997a). The good news is that synergistic cooperation among sportsman owners and players has led to their mutual gain. The bad news is that the internal erosion of monopsony power has turned the objectives of these monopoly leagues toward external exploitation of their own fan base and general tax-paying public.

5 Monopoly Power

5.1 Media Revolution

All four major leagues were granted antitrust exemption from the sale of pooled national "sponsored telecast" rights in the Sports Broadcasting Act of 1961 (SBA).[31] Collective negotiation of pooled rights fees was justified because of the natural interdependence of clubs in sports leagues and presumed social welfare from competitive balance. The argument against the league as cartel is the monopoly inefficiency problem of fewer games being offered to fans at a higher price "than they otherwise would be" under competitive negotiations. Sports rights are more complicated because television networks serve as media between upstream leagues and downstream viewers. In theory fan welfare is maximized when teams competitively negotiate individual deals with several media networks. Competitive solutions in upstream markets are not options in American media markets because of SBA exemption. As a result markets for American sports rights have evolved in an environment of upstream monopoly power where rent accrues to the leagues. Competition among several networks for split TV rights packages upstream is presumed to yield lower costs and greater choices for viewers downstream. Unfortunately for networks, downstream competition and upstream monopoly creates a worst case auction environment that systematically results in financial loss.

TV rights fees shown in Table 4 reveal the history of the best case for leagues and worst case for the networks. National rights fees for the NFL since the AFL-NFL merger dwarf MLB and NBA revenues four-to-one, and the NHL is a sports rights

[31] Eleven teams had contracts with CBS, two had contracts with NBC, and the Cleveland Browns had its own network. After pooled national TV contract between AFL and ABC in 1960 the court ruled against pooled rights selling by the NFL in *United States v. National Football League*, 196 F. Supp. 445, 446 (E.D. Penn.1961). The Sports Broadcasting Act reversed the decision to remedy an "apparent inequity" between the NFL and AFL.

"no-show". At the time of the AFL-NFL merger ABC was relegated to a prime-time Monday Night Football (MNF) experiment, and cozy partnerships between CBS-NFL and NBC-AFL continued for NFC and AFC after the merger.[32] NFL network affiliations were stable until the emergence of the FOX network as a sports rights bidder in the early 1990's.

The FOX Network crashed the 1993 NFL rights party by offering $395 million for prized NFC rights, compared to a second-best offer from CBS for $290 million for 1994–97.[33] The after-shock was delayed until the 1998–2005 rights payback auction where CBS regained AFC rights for a hefty $500 million and FOX retained NFC rights for $550 million. The second time around NBC was the odd network out of the NFL monopoly auction. ABC and its cable affiliate ESPN paid $1.15 billion for Sunday and Monday nights.[34] FOX affiliate DirecTV paid $400 million per year for exclusive rights to out-of-market games shown by pay-per-view on "NFL Sunday Ticket" and the NFL Network (launched in 2003) to be delivered via satellite platform.

After FOX had blown up traditional network partnerships, annual NFL rights fees tripled from $900 million 1990–93 to $2.6 billion 1998–2005. The explosion in rights fees forced incumbents ABC, CBS, and NBC to allow expensive NFL rights to migrate to ABC cable affiliate ESPN and FOX satellite affiliate DirecTV. In 2006 rights increased by 40 percent, and sports siphoning continued. ABC abdicated NFL rights by allowing Monday Night Football to migrate to cable affiliate ESPN for $1.1 billion. DirecTV paid $700 million annually for PPV Sunday Ticket and NFL Network, which produced its own exclusive eight-game package late in 2007.[35] All NFL games were available for a price, but access was becoming more exclusive through price discrimination and vertical integration.

The sports rights migration pattern was the same in the other leagues on a much smaller scale. MLB national rights fees increased twenty-fold from $18 million on NBC at the start of free agency in 1976 to $365 million on CBS and ESPN before the 1994 strike. After the strike FOX expanded its sports package to include MLB.[36] The post-strike MLB rights market was weak, and FOX, NBC and ESPN combined for $325 million annually 1996–2000. Since 2000 the traditional networks have abandoned MLB, and the $803 million rights 2007–13 are shared by FOX free-to-air, ESPN

[32] The AFL signed a five-year pooled agreement 1960–64 with ABC for $2.125 million per season. Immediately following the SBA exemption in 1961 the NFL struck annual deals with CBS for $4.65 million (1962–63).

[33] The FOX strategy was to run financial losses and use sports broadcasting to gain legitimacy as a fourth network rising from its 1986 start-up with a handful of UHF stations.

[34] ABC acquired ESPN in 1984 and Disney acquired ABC/ESPN in 1995. FOX Network launched in 1986 and is owned by Rupert Murdoch's News Corporation, which gained control of satellite platform DirecTV in 2003.

[35] Congressional inquiry into the SBA exemption came in 2007, when a NFL late-season game package was offered only on NFL Network on DirecTV and a Comcast Cable premium sports tier.

[36] The Baseball Network (TBN) was a revenue sharing arrangement among NBC, ABC, and MLB that failed during the strike of 1994–95. ESPN's six-year $255 million deal 1994–99 was voided by the strike and was renegotiated as a five-year $440 million deal 1996–2000. CBS lost $500 million 1990–93 and bid only $120 million after 1994.

Table 4 North American Television Rights Fees ($M)

Term	Years	Total Rights	Annual Rights	Broadcast				Cable			Satellite	Canadian CBC TSN
				ABC	CBS	NBC	FOX	ESPN	TBS	Other[a]	DirecTV	
National Football League												
1978–81	4	646	162	60	54	48	–	–	–	–	–	–
1982–86	5	2,100	420	115	120	107	–	–	–	–	–	–
1987–89	3	1,428	476	125	165	135	–	51	–	–	–	–
1990–93	4	3,600	900	225	265	188	–	111	111	–	–	–
1994–97	4	4,388	1,097	230	–	217	395	131	124	–	–	–
1998–05	8	19,600	2,600	550	500	–	550	600	–	–	400	–
2006–11	6	22,110	3,735	–	623	600	713	1,100	–	–	700	–
Major League Baseball												
1980–83	4	190	48	25	–	23	–	–	–	–	–	–
1984–89	6	1,125	188	96	–	92	–	–	–	–	–	–
1990–93	4	1,460	365	–	265	–	–	100	–	–	–	–
1994–95	2	415	208	83	–	83	–	42	–	–	–	–
1996–00	5	1,625	325	–	–	80	115	87	–	–	–	–
2001–06	6	3,351	559	–	–	–	417	142	-	–	–	–
2007–13	7	5,622	803	–	–	–	257	296	150	–	100	–
National Basketball Association												
1982–86	4	123	31	–	23	–	–	3	5	–	–	–
1986–90	4	248	62	–	43	–	–	–	19	–	–	–
1990–94	4	875	219	–	–	150	–	–	69	–	–	–
1994–98	4	1,100	275	–	–	188	–	–	88	–	–	–
1998–02	4	2,640	660	–	–	438	–	–	223	–	–	–
2002–08	6	4,600	767	–	–	–	–	400	367	–	–	–
2008–16	8	7,440	930	–	–	–	–	560	370	–	–	–

Table 4 continued

Term	Years	Total Rights	Annual Rights	Broadcast				Cable			Satellite	Canadian CBC TSN
				ABC	CBS	NBC	FOX	ESPN	TBS	Other[a]	DirecTV	
National Hockey League												
1985–88	3	36	12	–	–	–	–	8		–	–	4
1988–92	4	152	38	–	–	–	–	–	–	17	–	21
1992–94	2	185	37	–	–	–	–	16	–	–	–	21
1994–99	5	500	100	–	–	–	31	16	–	–	–	53
1999–04	5	878	176	–	–	–	–	120	–	–	–	56
2005–08	3	361	120	–	–	a	–	–	–	69	–	51
2008–11	3	443	148	–	–	–	–	–	–	75	–	73

Comparable media deals: *NASCAR* $560 million per year 2007–14 (8 years $4.48 billion) FOX/ ESPN/TNT
NCAA Basketball Tournament $565 million per year 2003–14 (11 years $6.2 billion) CBS
English Premier League $1.5 billion per year 2007–10 (3 years $4.5 billion) BSkyB/ Setanta/BBC
[a] *NHL* annual rights 1988–91 SportsChannel $17 million and $5.5 million in 1992; Comcast Vs $69 million 2005–08 and $75 million 2008–11. Canadian rights in $ US. NBC-NHL profit sharing deal 2005–08

and TBS cable, and DirecTV via satellite. MLB plans to launch MLB Network in 2009 to 50 million homes.[37]

After the post-strike rights recession in MLB, NBA national rights fees surpassed MLB for the first time. NBA rights fees of $660 million (1998–02) from NBC and TBS doubled the previous NBA contract of $275 million (1994–98), as well as MLB fees of $325 million (1996–00). After losing $300 million on its $438 million share of the over-priced deal, NBC offered a low bid of $325 million for NBA rights (2002–08) compared to ESPN's winning bid of $400 million. By 2002 NBA rights had completely migrated to cable ESPN and TBS (ABC held NBA rights through ESPN). In 2008 TBS agreed to manage all digital assets of the NBA, including NBA TV, NBA.com, and NBA League Pass. As "the longest running league/network partnership in professional sports" (since 1982) the NBA-TBS union fused monopoly power in the upstream NBA media market.

The disparity in total TV revenues among the leagues narrows with the inclusion of local media, because NFL clubs do not sell local TV rights. In MLB average local TV rights per club are greater than each club's national share. MLB total local media revenue increased from $571 million in 2001 to $837 million in 2006, compared to the MLB national annual contract average of $559 million 2001–06. The unequal distribution of rights fees among local markets leads to a revenue imbalance within the leagues. TV revenues of $322.6 million for the top 10 MLB clubs in 2001 are double the local TV revenues of $166.6 million for the second ten, and are quadruple the $81.9 million local TV rights of the bottom ten clubs.

Efficiency gains for downstream viewers from competition among the clubs are lost, if networks gain upstream media monopsony power. Regional FOX Sports Networks (FSN) control local media rights for two-thirds (57 of 90) of the clubs outside of the NFL (19 of 30 clubs in each MLB, NBA, NHL). Comcast SportsNet holds rights to 14 clubs, and Rogers Sportsnet controls rights for seven of eight Canadian teams. There are three two-team networks – Boston (NESN), Denver (ASE), and Baltimore-DC (MASN) – and six clubs control their own networks, including the New York Yankees on YES Network. All nine networks share common ownership with their respective clubs.[38] If regional sports networks are held by FSN, Comcast SportsNet, Rogers Sportsnet, or the clubs themselves, then upstream media markets are controlled by rent-seeking monopsony cartels.

5.2 Venue Revolution

After butting heads with Miami and Dade County over public renovation of the Orange Bowl, Miami Dolphins owner Joe Robbie decided in 1984 to build a private stadium

[37] The largest launch in cable history was made possible on satellite and basic cable when a one-third ownership in MLB Network was sold to DirecTV (16.67 percent) and the InDemand cable consortium.

[38] New England Sports Network (NESN) is 80% owned by Boston Red Sox and 20% by Boston Bruins; Altitude Sports Entertainment is owned by Stan Kroenke owner of Denver Nuggets and Colorado Avalanche; Mid-Atlantic Sports Network is owned by Baltimore Orioles 90% and DC Nationals 10% (increases to 33% over 20 years). Yankees cash flow from Yankee Entertainment Sports (YES) Network approaches $120 million annually.

backed by luxury suite revenues. The design of the stadium combined the mezzanine club seats of Kansas City Arrowhead with twin tiers of luxury suites in Texas Stadium. Joe Robbie Stadium opened in 1987 just outside Dade County at a cost of $115 million, including $13 million from the State of Florida. The revolutionary financial design involved up-front ten-year leasing of 216 luxury suites at $29,000–$65,000 per season, and 10,214 club seats at $600-$1400 per season. Dolphins' stadium debt was retired in ten years from $16 million annual payments from luxury seat revenue alone.

As it has since evolved the prototypical inside-out design shown in Fig. 4 has become a revolutionary form of spatial price discrimination. Lower bowl and upper-deck seating are appendages attached to a luxury-seat *motel in the middle*, rather than the reverse. Two funding problems emerged in the subsequent venue revolution. First, venue privatization potential was lost because venues received heavy public subsidies leveraged through monopoly relocation extortion threats. Second, fan shares of venue costs were financed by exclusionary schemes of personal seat licensing (PSL) and luxury-seat packages using all-or-nothing monopoly pricing that exhausts the consumer-surplus of the marginal fan.[39] Sports venue and media fan-exclusion tactics are virtually the same for games as quasi-public goods. Monopoly leagues and teams are charging fewer and fewer fans more and more money for the same all-or nothing season-ticket package.

Since the venue revolution began, the public has been hit with 56.4 percent of $30 billion venue costs for 107 venues in all four leagues.[40] In the NFL 28 of 32 clubs will be playing in new or renovated stadiums by 2010.[41] In MLB, 25 of 30 teams will be playing in new or renovated parks; all 30 NBA clubs will have new or renovated arenas; and 26 of 30 NHL clubs will be skating on new ice by 2010. In these deals the public share of venue cost varies inversely with market size. The eighteen largest U.S. markets over 1.5 million TV households can generate the cash flow sufficient for private venue funding, and most of them have teams in all four leagues. That leaves about 30 mid-markets, with between 600,000 and 1.5 million TV households, to compete in monopoly auctions for 10–12 expansion/relocation clubs per league by over-subsidizing teams and their venues.

[39] A PSL is the present value of a season ticket discount over the life of the season-ticket option. For example, if the true value of the season ticket is $1000 per season ($100 per game), a $5000 PSL would be paid up front for the season ticket priced at $500. PSLs usually work for relocation or expansion teams and first-time season-ticket holders. PSLs do not work if there is no discount or there is a limit to the life of the PSL option. The Oakland Raiders' bungled PSL offering in their 1995 relocation violated both of these basic principles.

[40] The public has borne 55.4 percent of the $11 billion cost of NFL stadiums; 65.6 percent of $9.4 billion in MLB; 62.7 percent of $3.8 billion costs for twenty NBA-only arenas; 59.2 percent of $3 billion costs for sixteen NHL-only arenas; and 10.9 percent of $2.4 billion costs for ten NBA and NHL combined arenas.

[41] After the New England Patriots threatened to move to Hartford in 1999, the NFL began a G-3 loan program that backed stadium loans with national TV money. Loans were repaid from a 34 percent visitor share of club seat premium. The League loaned up to 50 percent of private costs (max $150 million) for teams in the six largest TV markets, and up to 34 percent (max $100 million) in smaller markets. Twelve stadiums built under the $1 billion G-3 program averaged a 46.6 percent public share, and 15 stadiums built before G-3 averaged 73 percent.

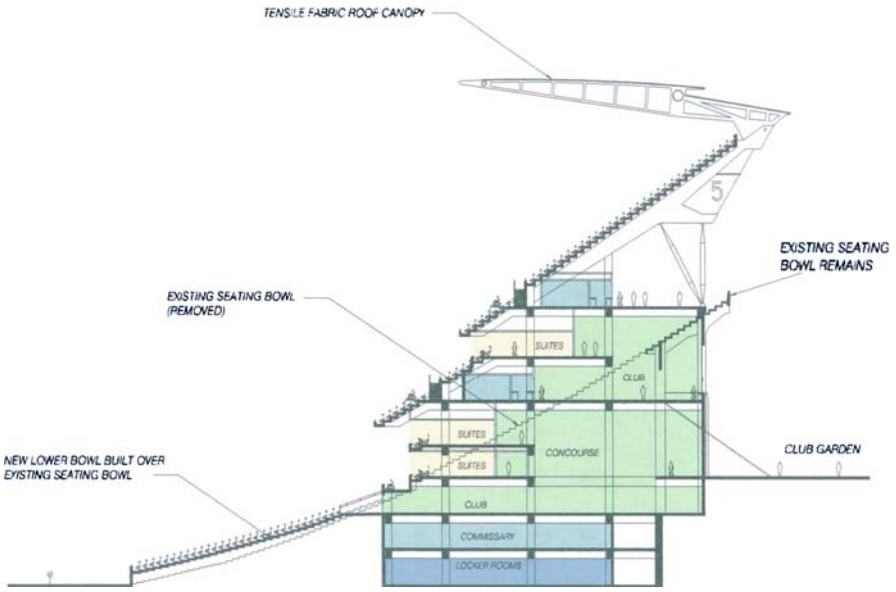

Fig. 4 L.A. Coliseum Existing Bowl and Proposed Renovation

To see how the NFL venue extortion game works, consider the relocation circus surrounding the 1995 two-team expansion. The six finalists were Oakland, Baltimore, St. Louis, Memphis, Charlotte, and Jacksonville. The first three had lost teams to previous relocation-extortions: the Oakland Raiders to L.A. in 1982; the Baltimore Colts to Indianapolis in 1984, and the St. Louis Cardinals to Phoenix in 1988. The surprise expansion choices were Charlotte and Jacksonville. Carolina was selected because of the economics of its stadium design (158 suites and 11,300 club seats) and $158 million in PSL money.[42] Jacksonville was granted a franchise based on an advanced sale of 10,000 club seats for $75 million. Each team paid a fee of $140 million and took a one-half TV share for three years.

Each of the four frustrated finalists (with venue subsidies in had) became immediate relocation targets for existing NFL clubs seeking easy public money for new venues. In 1995 the L.A. Raiders moved back to Oakland in return for 100 percent public renovation of Oakland Alameda County Coliseum (143 luxury suites and 6,300 club seats), and the L.A. Rams relocated to St. Louis for 100 percent public funding of the Edward Jones Dome (142 suites and 6,200 club seats). In 1996 the Cleveland Browns became the Baltimore Ravens for 87 percent public funding of the M&T Bank Stadium (open in 1998 with 108 suites and 7,900 club seats), and the Houston Oilers moved to Nashville for 76 percent public funding of LP Field (open in 1999 with 143

[42] Because the $158 million PSLs were sold by the Carolina Panthers, about $60 million was paid in Federal income taxes. Later $80 million in PSLs were sold by the St. Louis Convention & Visitors Commission (CVC) for the Rams. The Rams' PSL funds were not taxable, because the CVC is a public authority. All subsequent PSL financing schemes shielded PSL revenue from Federal income tax liability by using the public authority loophole. So about one-third of PSL subsidies were shifted to general taxpayers.

suites and 9,600 club seats). All four relocation schemes used PSL fees, but not for stadium construction. Each city paid direct PSL subsidies to the relocating teams and $29 million relocation fees to the NFL.[43]

The NFL retro-expanded into Cleveland in 1999 for 75 percent public funding of the new Browns Stadium with 147 suites and 8,800 club seats. After several delays between self-defeating L.A. investment groups, the NFL decided to retro-fill the Houston market instead for 71 percent public funding of Reliant Stadium (191 suites and 8,300 club seats) in 2002. The new Cleveland Browns paid an expansion fee of $530 million, and the Houston Texans paid a premium fee of $700 million to outbid L.A. That left the second largest U.S. TV market without a NFL team. This was not a major problem for two reasons. First, L.A. teams rarely sold out games especially in the cavernous L.A. Coliseum, and the black-out rule makes L.A.'s TV market (5.65 million TV households) irrelevant. Second, the NFL prefers to keep at least one major market open for the venue extortion triangles of other clubs. L.A. relocation has been used in subsequent threats by the New Orleans Saints, Arizona Cardinals, Indianapolis Colts, and San Diego Chargers.[44]

As discussed more extensively in Vrooman (1997b), teams in the other leagues make relocation threats, but NFL clubs are greater flight risks because, given the amount of revenue sharing, it doesn't matter where they play as long as it is in a new venue. The last MLB team to relocate before the Montreal Expos moved to Washington in 2005 was the Washington Senators' move to the Texas Rangers in 1972. This does not mean that other leagues lack monopoly power to play the extortion game. Consider the relocation of the Montreal Expos to Washington DC in 2005:

MLB announced contraction of the Expos and Minnesota Twins for 2002 season because of "economic problems." After the Twins contraction became a legal issue with the State of Minnesota, MLB owners delayed contraction and partnered to buy the Expos for relocation. MLB bought the Expos from Jeff Loria for $120 million in 2002 and shopped the team for relocation to the city that showed the greatest "public interest."[45] Final bidding came down to Portland's 50–50 public-private offer, and Washington DC's 100 percent public subsidy (capped at $611 million). This relocation auction was unique in that MLB negotiated directly with the cities first and then sold the franchise and ballpark deal for $450 million in 2006. After four years MLB

[43] St. Louis sold $80 million in PSLs: $20 million went for the $29 million Rams relocation fee, $17 million for PSL sharing with the League, $28 million for the Rams lease in Anaheim, and $15 million for a practice facility. Oakland sold $68 million in PSLs: $53.9 million for the Raiders non-recourse loan, plus $10 million for a practice facility. The Raiders forewent $46.3 million in a court 1987 settlement and paid no relocation fee. The Maryland Stadium Authority sold $67 million in PSLs: $22 million for the Ravens' lease in Cleveland, $16 million for the lost Browns' expansion fee, and $29 million in relocation fee. Nashville sold $71 million PSLs, for $29 million relocation fee and stadium costs.

[44] In lieu of a stadium the Saints get a $186.5 million subsidy for 2001–10. The Cardinals took a two-thirds public subsidy for their new stadium in 2006. The Colts received a $575 million subsidy for the $675 million Lucas Oil Stadium in 2008.

[45] MLB loaned Loria $34.5 million to buy the Florida Marlins from John Henry for $158.5 million, the same price that Henry paid Wayne Huizenga in 1999. Henry simultaneously joined a partnership to buy the Boston Red Sox and 80 percent of NESN for $700 (including $40 million in assumed debt) from the Jean Yawkey Trust.

owners flipped the $120 Expos for $450 million and extracted the full public ballpark surplus in the process.[46]

6 Competitive Balance

6.1 Revenue and Cost Disparity

Intra-league financial results for NFL and MLB teams are compared in Table 5 for the 2006 season. The equalizing effect of revenue sharing and the salary cap in the NFL are clear. The coefficient of variation (CV) among revenues of NFL clubs in 2006 is 12.6 percent, which has been stable since before the salary cap (12 percent in 1993). NFL 2006 payrolls have a tight CV of 10.6 percent, which has been steady since inception of the cap in 1994 (CV = 8.8 percent). In the seasons (1990–93) before the salary cap the NFL payroll spread was about 16 percent from revenue sharing only. The relatively high NFL revenue multiple of 4.7 reflects relative revenue and cost certainty in spite of the players' payroll-revenue share of 61.4 percent. Expected revenues of teams soon playing in new venues (Indianapolis Colts in 2008, Dallas Cowboys in 2009, and Kansas City Chiefs, N.Y. Jets, and N.Y. Giants in 2010) have higher valuation multiples 5.0 to 6.2. The bottom eight NFL clubs with multiples of 4.3 reflect cash flow disadvantages of playing in older venues. All eight clubs are current NFL relocation-extortion threats.

The revenue and cost disparity among MLB clubs is also obvious. MLB club-revenue CV was 21.8 percent in 2006, which was down ten points from 31.8 percent in 2000 (29.1 percent in 2002 and 30.4 percent in 1990). This was the result of increased revenue sharing in MLB, but the redistribution effects are modest compared to the NFL. Payroll variation among MLB clubs increased to 36.2 percent in 2006 (40 percent in 2004) from 23.4 percent in 1990. The relatively low MLB valuation multiple of 2.5 reflects this revenue and cost variation. The five most valuable clubs are separated from the rest of MLB with revenue multiples over 3.0. Expected ballpark revenue strengthens the Washington Nationals in 2008 and NY Mets and NY Yankees in 2009.[47]

Intra-league financial results for the NBA and NHL are shown in Table 6 for the 2006–07 seasons. The two-to-one revenue disparity reflects the lack of revenue sharing, and the payroll variations show the nature of salary caps in both leagues. The CV

[46] NBA played arena extortion games in relocations of the Vancouver Grizzlies to Memphis in 2001 with a 100% subsidy for the $250 million FedEx Forum (75 suites, 2500 club seats) and the Charlotte Hornets to New Orleans in 2002 with a 100% subsidy of New Orleans Arena (54 suites, 2450 club seats), followed by retro-expansion Charlotte Bobcats in 2004 for a 92% subsidy of $265 million Bobcat Arena (70 suites, 2500 club seats). The Grizzlies and Hornets each paid $30 million in relocation fees, and the Bobcats paid $300 million expansion fee.

[47] The disincentive with revenue sharing is seen in clubs like the Florida Marlins, whose $31 million payroll was less than its $33.4 million revenue sharing transfer or MLB's national revenue share of $53.3 million for 2006. MLB requires teams "to spend receipts to improve on-field performance." MLB transferred a $326 million total in 2006. Major payers were the NY Yankees $78.7 million, Boston Red Sox $59.7 million and NY Mets $30.7 million. Major recipients were the Tampa Bay Rays $36 million, Florida Marlins $33.4 million, Kansas City Royals $33.2 million, Toronto Blue Jays $31 million, Pittsburgh Pirates $25 million, and Minnesota Twins $22 million.

Table 5 NFL and MLB Financial Results 2006 Season ($M)

NFL	Value	Rev	V/R	Pay	P/R	MLB	Value	Rev	V/R	Pay	P/R
Dallas Cowboys	1,500	242	6.2	140	.579	New York Yankees	1,200	302	4.0	219	.725
Washington Redskins	1,467	312	4.7	142	.455	New York Mets	736	217	3.4	125	.576
New England Patriots	1,199	255	4.7	125	.490	Boston Red Sox	724	234	3.1	146	.624
Houston Texans	1,056	225	4.7	132	.587	Los Angeles Dodgers	632	211	3.0	113	.536
Philadelphia Eagles	1,052	224	4.7	128	.571	Chicago Cubs	592	197	3.0	115	.584
Denver Broncos	994	212	4.7	127	.599	St. Louis Cardinals	460	184	2.5	103	.560
Chicago Bears	984	209	4.7	117	.560	San Francisco Giants	459	184	2.5	99	.538
New York Giants	974	195	5.0	130	.667	Atlanta Braves	458	183	2.5	110	.601
Cleveland Browns	969	206	4.7	119	578	Philadelphia Phillies	457	183	2.5	108	.590
New York Jets	967	193	5.0	115	.596	Washington Nationals	447	144	3.1	74	.514
Baltimore Ravens	965	205	4.7	142	.693	Houston Astros	442	184	2.4	106	.576
Tampa Buccaneers	963	205	4.7	111	.541	Seattle Mariners	436	182	2.4	101	.555
Kansas City Chiefs	960	196	4.9	105	.536	Anaheim Angels	431	187	2.3	112	.599
Carolina Panthers	956	203	4.7	128	.631	Baltimore Orioles	395	158	2.5	86	.544
Miami Dolphins	942	215	4.4	133	.619	Chicago White Sox	381	173	2.2	102	.590
Pittsburgh Steelers	929	198	4.7	117	.591	San Diego Padres	367	160	2.3	90	.563
Green Bay Packers	927	197	4.7	121	.614	Texas Rangers	365	155	2.4	82	.529
Tennessee Titans	922	196	4.7	112	.571	Cleveland Indians	364	158	2.3	72	.456
Seattle Seahawks	921	196	4.7	132	.673	Detroit Tigers	357	170	2.1	98	.576
Cincinnati Bengals	912	194	4.7	133	.686	Toronto Blue Jays	344	157	2.2	90	.573
Indianapolis Colts	911	184	5.0	153	.832	Arizona D-Backs	339	154	2.2	88	.571
St Louis Rams	908	193	4.7	127	.658	Colorado Rockies	317	151	2.1	63	.417
Arizona Cardinals	888	189	4.7	134	.709	Cincinnati Reds	307	146	2.1	69	.473
Detroit Lions	870	189	4.6	125	.661	Oakland Athletics	292	146	2.0	80	.548
New Orleans Saints	854	194	4.4	118	.608	Minnesota Twins	288	131	2.2	76	.580
San Diego Chargers	826	192	4.3	125	.651	Milwaukee Brewers	287	144	2.0	65	.451
Buffalo Bills	821	189	4.3	102	.540	Kansas City Royals	282	123	2.3	66	.537
Oakland Raiders	812	189	4.3	94	.497	Pittsburgh Pirates	274	137	2.0	53	.387
Jacksonville Jaguars	811	189	4.3	121	.640	Tampa Bay D-Rays	267	134	2.0	57	.425
San Francisco 49ers	799	186	4.3	118	.634	Florida Marlins	244	122	2.0	31	.254
Atlanta Falcons	796	185	4.3	138	.746						
Minnesota Vikings	782	182	4.3	151	.830						
32 Team Average	957	204	4.7	125	.614	30 Team Average	431	170	2.5	93	.548
Coefficient of Variation	.171	.126	.075	.106	.139	Coefficient of Variation	.446	.218	.186	.362	.158

Source: *Forbes*. Pay includes benefits and bonuses. Revenues are net after revenue sharing

of revenues among NBA clubs has been about 24 percent since 2000, down from 30 percent in the early 1990's. The variation of NBA team player costs in 2006–07 was 19.1 percent, and consistently about 20 percent since 1990. Revenue disparity in the

Table 6 NBA and NHL Financial Results 2006–07 Seasons ($M)

NBA	Value	Rev	V/R	Pay	P/R	NHL	Value	Rev	V/R	Pay	P/R
New York Knicks	608	196	3.1	121	.617	Toronto Maple Leafs	413	138	3.0	49	.355
Los Angeles Lakers	560	170	3.3	81	.476	New York Rangers	365	122	3.0	49	.402
Chicago Bulls	500	161	3.1	58	.360	Detroit Red Wings	293	109	2.7	53	.486
Detroit Pistons	477	154	3.1	63	.409	Montreal Canadiens	283	109	2.6	46	.422
Houston Rockets	462	149	3.1	68	.456	Dallas Stars	254	91	2.8	48	.527
Dallas Mavericks	461	140	3.3	91	.650	Philadelphia Flyers	244	87	2.8	47	.540
Cleveland Cavaliers	455	152	3.0	69	.454	Boston Bruins	243	87	2.8	46	.529
Phoenix Suns	449	145	3.1	66	.455	Colorado Avalanche	214	79	2.7	43	.544
Miami Heat	418	131	3.2	68	.519	Vancouver Canucks	211	96	2.2	46	.479
San Antonio Spurs	405	131	3.1	69	.527	Los Angeles Kings	209	84	2.5	42	.500
Boston Celtics	391	117	3.3	67	.573	Tampa Bay Lightning	199	85	2.3	48	.565
Sacramento Kings	385	128	3.0	68	.531	Anaheim Ducks	197	89	2.2	43	.483
Philadelphia 76ers	380	112	3.4	75	.670	New Jersey Devils	195	65	3.0	55	.846
Toronto Raptors	373	124	3.0	57	.460	Ottawa Senators	186	93	2.0	46	.495
Washington Wizards	348	112	3.1	67	.598	Minnesota Wild	180	78	2.3	43	.551
Utah Jazz	342	114	3.0	66	.579	Chicago Blackhawks	179	69	2.6	42	.609
New Jersey Nets	338	102	3.3	68	.667	San Jose Sharks	165	72	2.3	43	.597
Indiana Pacers	333	107	3.1	67	.626	Calgary Flames	164	77	2.1	46	.597
Orlando Magic	322	92	3.5	65	.707	Buffalo Sabres	162	74	2.2	44	.595
Denver Nuggets	321	104	3.1	70	.673	Edmonton Oilers	157	71	2.2	42	.592
Golden State Warriors	309	103	3.0	69	.670	Carolina Hurricanes	156	68	2.3	42	.618
Minnesota T. Wolves	308	103	3.0	71	.689	Pittsburgh Penguins	155	67	2.3	34	.507
Memphis Grizzlies	304	98	3.1	66	.673	Florida Panthers	151	67	2.3	39	.582
Los Angeles Clippers	294	98	3.0	63	.643	Columbus Blue Jackets	150	68	2.2	41	.603
Charlotte Bobcats	287	93	3.1	46	.495	New York Islanders	149	60	2.5	45	.750
Atlanta Hawks	286	95	3.0	53	.558	Atlanta Thrashers	148	67	2.2	44	.657
New Orleans Hornets	272	91	3.0	58	.637	Phoenix Coyotes	147	67	2.2	43	.642
Seattle SuperSonics	269	81	3.3	61	.753	Washington Capitals	145	66	2.2	35	.530
Milwaukee Bucks	264	88	3.0	68	.773	St Louis Blues	144	66	2.2	38	.576
Portland Trail Blazers	253	82	3.1	82	1.000	Nashville Predators	143	65	2.2	43	.662
30 Team Average	372	119	3.1	69	.577	30 Team Average	200	81	2.5	44	.544
Coefficient of Variation	.244	.240	.045	.189	.225	Coefficient of Variation	.333	.229	.117	.102	.179

Source: *Forbes*. Pay includes benefits and bonuses

NHL has been similar to the NBA with a CV in 2006–07 of 22.9 percent, down from 33 percent in the early 1990's. Variation in player costs among NHL clubs rose from 25 percent in the early 1990's to 31 percent just before the 2004–05 lockout (similar to MLB). After the hard cap, NHL payroll variation dropped to 10.2 percent in 2006–07 (similar to NFL).

In summary, intra-league variation in revenue ranges from 20 percent in MLB, NHL, and NBA to ten percent in the NFL. Payroll variation ranges from 40 percent in MLB, to 20 percent in soft cap NBA and 10 percent variation in hard cap NFL and NHL. This evidence shows that revenue sharing and payroll caps are effective controls of revenue and cost distribution. If revenue sharing and salary caps affect intra-league revenues and costs, then the important question concerns their impact on competitive balance.

6.2 Competitive Balance

The dynamics of competitive balance are captured in an auto-regressive β-estimate of continuity of winning percentages w_{ijt} for team i in league j from season $t-1$ to season t:

$$w_{ijt} = \alpha + \beta w_{ijt-1} + \varepsilon_{ijt},$$

where $\beta \in [0, 1]$. If $\alpha = .500$ and $\beta = 0$, then $w_{ijt} = .500$, and each season is a random walk where every team has an equal chance to win. If $\alpha = 0$ and $\beta = 1$, then $w_{ijt} = w_{ijt-1}$, and season outcomes are predetermined. Separate regression equations were estimated using binary interaction variables to test for differences among the four leagues for each of three phases: phase 1 (1971–83), phase 2 (1984–95), and phase 3 (1996–2007). β-estimates for each league in the three phases are shown along the diagonal of the matrix in Table 7, and differences between league β coefficients are shown in respective off-diagonal cells. Separate equations were then estimated for each league using binary interaction variables to test for differences of the beta in each phase from the overall 1971–2007 period.

The beta matrix leads to the following observations: NFL *beta* declines significantly from .530 in phase 1 to .286 in phase 3. Phase 1 competitive balance is statistically the same in all leagues except for the NHL with $\beta = .749$. NHL phase 1 imbalance is matched by NBA dynasties in phase 2 where $\beta = .716$. The NFL is statistically the most balanced of all leagues in phase 3 by a β-margin of at least .250. MLB *beta* estimates are greater than .500 in phases 1 and 3 but significantly lower during the pre-strike chaos in phase 2. NBA becomes more imbalanced during phase 2 after the implementation of the soft cap in 1984, and then its β drops during phase 3. NHL's β decreases significantly from phase to phase, and differs only from the NFL in phase 3. (NHL $\beta = .556$ is .270 greater than NFL $\beta = .286$). The widest off-diagonal margin of separation occurs in phase 2 between MLB chaos and NBA dynasty (MLB $\beta = .313$ is .404 less than NBA $\beta = .716$). The most unbalanced leagues have been the NHL in phase 1 and the NBA in phase 2, and the NFL has clearly become the most balanced league in phase 3.

Competitive balance β coefficients were also estimated for each season 1971–2007 and separately mapped for the four major leagues in Figs. 5–8. The three phases of NFL β-balance since the AFL-NFL merger in 1970 can be seen in Fig. 5. Imbalance of the 1970s is modified by major increases in shared TV rights fees in 1982 and balanced scheduling after 1987. Increased parity of the NFL ($\beta \rightarrow .25$) after 1998 was the combined result of the TV rights explosion in 1998 and the hard salary cap with a

Table 7 Competitive Balance Beta Matrix 1971–2007

	NFL			MLB			NBA			NHL		
Phase	1	2	3	1	2	3	1	2	3	1	2	3
NFL	.530**	.447**	.286**									
	(16.4)	(14.3)	(8.43)									
MLB	.045	−.133	.247*	.575**	.313**	.513**						
	(0.45)	(−1.3)	(2.60)	(6.06)	(3.26)	(6.00)						
NBA	.049	.270*	.341*	.004	.404*	.093	.580**	.716**	.626**			
	(0.72)	(5.22)	(6.34)	(.04)	(3.87)	(.95)	(9.66)	(17.4)	(15.0)			
NHL	.219*	.150*	.270*	.174	.284*	.023	.170*	−.119	−.071	.749**	.597**	.556**
	(3.20)	(2.18)	(3.53)	(1.55)	(2.49)	(.20)	(2.00)	(−1.61)	(−.88)	(12.5)	(9.71)	(8.09)

Phase 1 (1971–82): N = 1040, R^2 = .345; Phase 2 (1983–95): N = 1309, R^2 = .316; Phase 3 (1996–2007): N = 1383, R^2 = .221
t-ratios in parentheses: * Significant at .05; ** Phase significantly different from overall period at .05

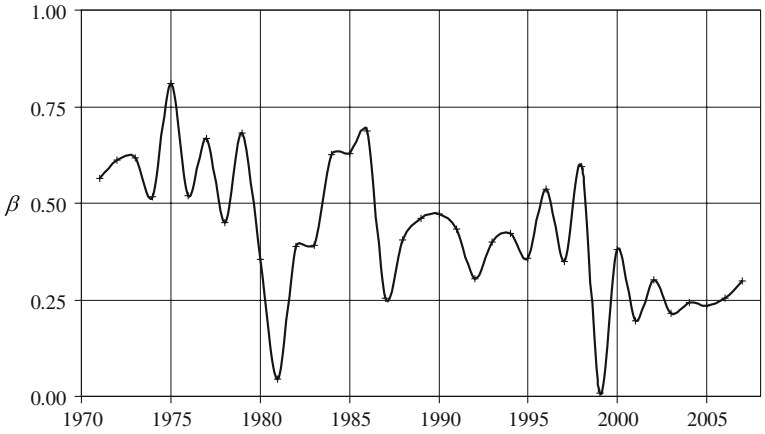

Fig. 5 National Football League

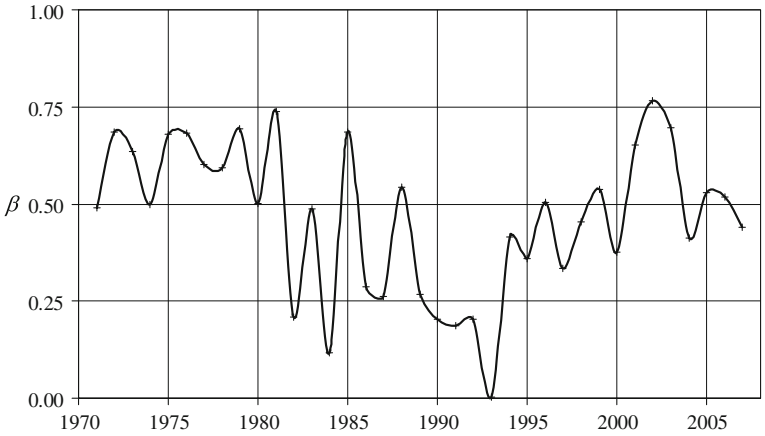

Fig. 6 Major League Baseball

delay equal to the average NFL contract length of four-years.[48] The history of MLB *betas* in Fig. 6 shows balance $\beta \rightarrow .5$ also evolving in three stages. Randomization of MLB competition $\beta \rightarrow 0$ in pre-strike phase 2 was the result of 1990 TV rights surge flowing through a three-tier bottleneck in the baseball players' labor market as discussed in Vrooman (1996).

The NBA β path in Fig. 7 traces the effects of planned competitive imbalance from the soft cap during the NBA dynasty era. The recent NBA shift toward a more bal-

[48] The hard NFL cap can be avoided temporarily by prorating player bonuses over the life of a contract. A prorated bonus is carried forward as "dead-money" that cannot be paid out under future caps. Hence the NFL hard cap can be avoided in the short run, but the amount over the cap now must equal the amount under the cap later. The average contract length suddenly jumped from three to four years immediately after the hard cap in 1994. Competitive chaos in the NFL after 1999 is the direct result of the hard cap with a four-year contract delay.

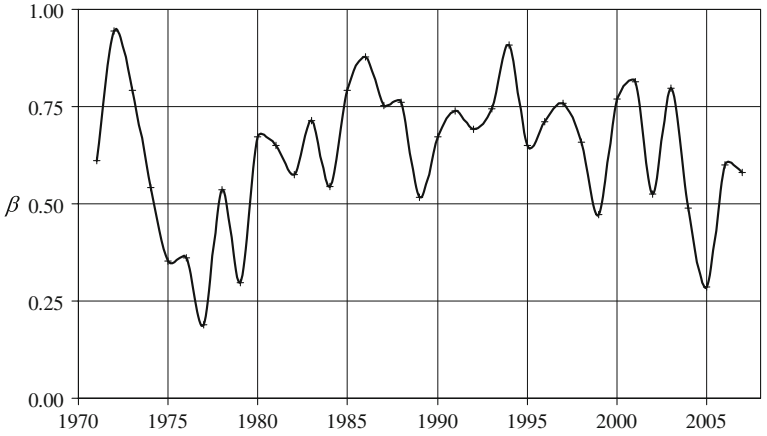

Fig. 7 National Basketball Association

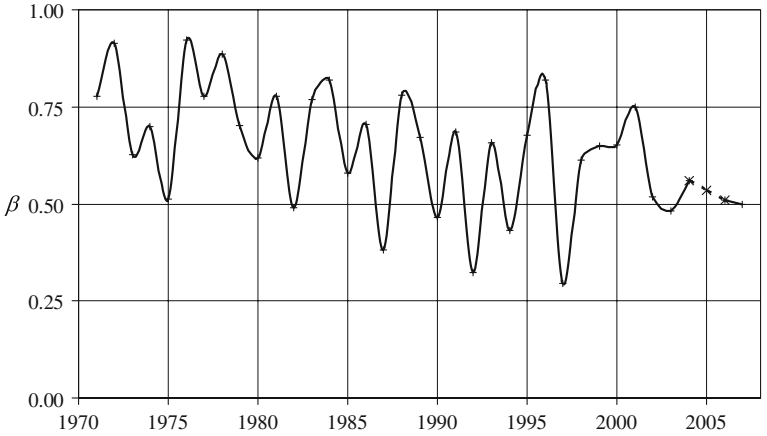

Fig. 8 National Hockey League

anced league since 2002–03 shows the effects of the luxury tax as hard cap. NHL *betas* in Fig. 8 show a gradual reduction in competitive imbalance during Sunbelt expansion followed by $\beta \rightarrow .5$ after the 2004–05 lockout and hard cap. When MLB competition hit β-zero before the 1994–95 strike, MLB was in a state of chaos with equally bad teams beating one another. Similar parity in the NFL ($\beta \rightarrow .25$) in phase 3 reflects teams' being torn apart by the intolerance of a hard payroll cap. Efficient β-balance lies between the mediocrity of NFL parity and determinism of NBA dynasty ($.25 \leq \beta \leq .75$).

7 Conclusion

If team owners are profit maximizers, then the *invariance proposition* holds that revenue sharing leads to player exploitation and does not affect competitive balance. If

owners are win-maximizers instead, then competition is more unbalanced, but revenue sharing among sportsmen can increase balance, league revenues, and payrolls. Empirical evidence from sports leagues defies the logic of competitive invariance, exploitation, and profit maximization. There is contrary evidence that American sports leagues have become dominated by sportsmen since 1990. As the result of internal competition among sportsman owners, monopsonistic exploitation has virtually vanished over the last decade in all leagues. All leagues have similar carrying capacities for player costs at two-thirds of revenues and current payroll cap percentages are almost identical at about 60 percent.

As expected, revenue sharing in sportsman leagues fosters competitive balance with or without joint implementation of salary caps. The NFL has imposed a hard salary cap since 1994 and shared two-thirds of its revenue since the early 1960's. As a fully diversified "perfect portfolio" the NFL has become the most balanced and wealthiest sports league in the world.[49] In 2001 MLB claimed losses of $.5 billion on revenues of $3.5 billion to justify contraction of two teams. Instead of contraction MLB overhauled its revenue-sharing scheme in 2002 and 2006. By 2007 MLB reported gross revenues over $6 billion, rapidly closing on the NFL at $7 billion.

Each league still has internal revenue and cost distribution problems. At one extreme the NFL is almost too perfect. An intolerant ten percent NFL payroll range is insufficient for a natural team talent/payroll cycle to evolve. NFL teams are prematurely torn apart to create chaotic mediocrity rather than competitive balance. At the other extreme MLB is the only league without a payroll cap. This results in distorted MLB payroll distribution with a greater variance than revenue variance.[50] The season is over before it begins for the bottom half of MLB. In the absence of significant revenue sharing, the NBA tax and NHL payroll range create competitive balance at the expense of the players' share of revenues.

These problems can be solved with modified revenue-sharing payroll-range systems similar to that of the NFL. First, all leagues should share at least 50 percent of total revenue after private venue costs in a straight-pool system.[51] Second, the payroll range should be simplified to a maximum cap of two-thirds of league revenue and a

[49] Sportsman salary compression is greater in European football, where revenue sharing (solidarity) is less and competitive imbalance is much higher. Big Five β since 1995: Italian Serie A (.772), English Premier League (.769), Spanish La Liga (.597), German Bundesliga (.549), and French Ligue 1(.455); next four next smaller leagues: Netherlands (.773), Portugal (.752), Belgium (.687), and Scotland (.746). See Vrooman (2007).

[50] In 2000 the MLB Blue Ribbon Committee recommended that MLB share 50 percent of local revenue and proposed a 50 percent luxury tax to cap payrolls. The CBT threshold was $84 million and a minimum $40 million in 1999, when the average team revenue was $93 million. This sets the tax-cap at 90 percent and a minimum at 43 percent of revenue. The CBT amounts to a NY Yankee tax that has no impact on competitive balance.

[51] Venue cost deduction creates cost-revenue symmetry within the league, which encourages privatization and reduces venue relocation-extortion. The New York Mets are paying 42 percent of $771 million CitiField (2009), and the New York Yankees are paying 52 percent of $1 billion New Yankee Stadium (2009). Both teams deduct venue depreciation costs from local revenue before applying the 31 percent MLB revenue sharing formula. The New York Jets and Giants are paying 76 percent of their joint-effort $1.7 billion New Meadowlands Stadium (2010) with the help of $300 million NFL G-3 loan repaid from the visitors' share of luxury-seat fees.

minimum of 50 percent of revenue (75 percent of the cap). The parameters for the three capped leagues set a reasonable payroll range for MLB (excluding player development expenses). Based on 2006 MLB numbers from Table 4 the proposed two-thirds payroll cap of $113 million in MLB would clip the high-rolling NY Yankees, NY Mets, and Boston Red Sox and the 50 percent minimum of $85 million would boost the bottom-feeding six payrolls.

As monopsony power has receded, major-league monopoly power has surged. Statutory cartelization of TV rights has resulted in the siphoning of exclusive broadcasts from network to cable to satellite and led to vertical integration of teams and leagues as broadcasting networks. Quasi-public monopoly leagues have crossed the line between private matters of internal governance and the external realm of public policy. Future policy should revisit statutory monopoly power granted through the SBA exemption, and reconsider the anti-competitive effects of public venue subsidies leveraged through limited opportunities for league expansion and extortion threats of franchise relocation.

Optimal competitive balance is an empirical question complicated by sports leagues as naturally cooperative cartels. Theory implies that revenue sharing in profit-max leagues is inefficient because it increases monopsony power, and yet revenue sharing is efficient in sportsman leagues because it increases competitive balance. Future research should determine the blend of cooperation and competition that maximizes social welfare in professional sports leagues. In theory the perfect game is a symbiotic contest between evenly matched opponents, but in practice the perfect game is an evenly matched contest between chance and fate.

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