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Kevin G. Quinn *Editor*

The Economics of the National Football League

The State of the Art

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Chapter 1
Introduction

Kevin G. Quinn

The National Football League (NFL) is nearly a $10 billion/year business that generates about $1 billion in operating profit, and its 32 franchises are estimated to be worth more than $30 billion.[1] To put these figures in perspective, the NFL's annual revenue is about equal to one-fortieth of Walmart's, the top grossing company on the Fortune 500 list, and about the same as Whole Foods Markets' (#273) (CNNMoney 2011). The value of all of its franchises is about one-fiftieth of Exxon/Mobil's market capitalization (#1 in the world, according to *Financial Times*) and about equal to Sony's (#269) (Financial Times 2011).

The NFL is a considerably bigger enterprise than the next largest North American team sport league, Major League Baseball (MLB). Its revenues are approximately 50% higher, with about double the total operating profit and franchise valuations (Forbes 2010, 2011). Substantially more Americans identify themselves as NFL fans than do so for MLB (111 vs. 84 million in 2009) and more people watch at least one NFL game per year on television than is the case for MLB (110 vs. 77 million) (SBRNet 2011).

Despite the NFL's substantial economic and cultural impact, the sports economics academic literature on the league historically has been relatively sparse, particularly when compared to MLB. A keyword search for "NFL and football" of 128 top-level economics journals included in the JSTOR digital archive turned up only 113 articles, the vast majority of which discuss the NFL only tangentially.[2] The same search on EconLit yields a total of 60 articles published since 1991. A year-by-year search for "NFL and football" of the Business, Finance, and Business

[1] Revenue figure for 2011 based on numerous published reports. Franchise profits and valuations from CNNMoney (2011). Additional estimates and discussions of these values can be found elsewhere in this volume.

[2] The acronym NFL usually does refer to the National Football League, but has also been used in the economic literature with other meanings; e.g., "no free lunch" or "net financial liabilities."

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Administration domain considered by Google Scholar (which includes peer reviewed journals as well as books, working papers, and other work that is not peer reviewed) indicates that the quantity of NFL-related contributions in sports economics remains relatively small. However, it is increasing exponentially, roughly doubling every 5 years over the last quarter century.[3,4]

While these exercises are not rigorous content analyses, they do support the claim that sports economists have many opportunities to add to this literature. Schatz (2005) summarized the situation: "If baseball research is now about where (mathematics) was in 1900, football research is about where the Arabs were when they invented algebra." Fortunately, the last several years have seen a notable increase in the amount of attention sports economists pay to the NFL. Fizel's (2006) *Handbook of Sports Economics Research*, was able to offer excellent surveys on the National Basketball Association (NBA), the National Hockey League (NHL), European soccer, individual sports, and women's athletics, among other subjects, but had to apologize for the volume's omission of American football due to the "limited scope of NFL research" extant. Five years hence, there is less need for such apologies.

The goal of this volume is to lay down a marker as to the state of sports economists' understanding of the NFL. The chapters that follow include a mix of original research, literature reviews, and sophisticated critical surveys of what sports economists know about the NFL, with an emphasis on providing comprehensive and current topic overviews rather than to break new ground. The tone and style of the writing assumes some advanced economics background, but is meant to better reflect a professional reference volume than a collection of journal articles. The primary audiences to which this book is aimed are academic sports economists, sports management professionals and policy-makers, and it is intended to be appropriate for library reference collections or as a supplementary text for sports economics and sport management courses.

Chapter authors have been selected for their particular areas of expertise, based on their own contributions to the academic literature relating to the specific about which they have written. They have been drawn primarily from the membership of the North American Association of Sports Economists, but the work of academic experts from other disciplines also is included. It is fair to say that the these authors are a group of the most accomplished researchers in the field, and that which follows is a true reflection of what is known by the top tier of the sports economists who study the NFL.

The book is divided into four parts. Chapters 2–4 provide an overview of the business of the NFL from an economist's perspective. In Chap. 2, John Vrooman opens the volume by laying out the economic landscape in which the league operates. Jason Winfree summarizes how NFL franchises are valued from a variety of perspectives in Chap. 3. In Chap. 4, Phillip Miller details the league's primary revenues and costs.

[3] Searches done on June 24, 2011.

[4] Hits by year data generated by the Google Scholar search was estimated using an OLS exponential model, and found to follow: Hits $= 5.96\ e^{0.14\,\text{year}}$ ($R^2 = 0.93$).

Part II is a collection of surveys of the economics of the NFL's most important revenue streams. Aju Fenn's Chap. 5 summarizes what sports economists know about game attendance. Chapter 6, written by Michael Mondello, discusses the media's role that centers the NFL's modern economic structure. Stephen McKelvey has contributed a survey of how the league merchandises its brand and the values associated with those activities in Chap. 7.

The NFL's labor economics is the focus of Part III.[5] David Berri and Brian Burke in Chap. 8 address issues in productivity measurement that are unique to the NFL. In Chap. 9, Anthony Krautmann and John Solow analyze labor contract economics associated with the NFL's unique labor market institutional structure. The economics of the league's annual player entry draft system is the focus of Joel Maxcy's contributions in Chap. 10, and Chap. 11 is a comprehensive survey by Keith Malone, Jim Couch, and J. Douglas Barrett of the market for NFL coaches and managers.

A collection of various and sundry topics make up the chapters in Part IV. Rodney Fort writes about the league's competitive balance situation in Chap. 12, while Rodney Paul, Robert Simmons, and Andrew Weinbach survey the economics of gambling literature as it relates to the NFL in Chap. 13. Chapter 14, by Robert Baade and Victor Matheson analyze what is known about the economic impacts of the two NFL megaevents, the Super Bowl and the Pro Bowl. Paul Bursik's Chap. 15 is an essay about the application of behavioral economics to issues of interest in the NFL and is a departure from the standard neoclassical analysis of the league. Chapter 16, by Adam Winters, is an attorney's perspective on the antitrust issues associated with the league and its operations. Finally, Chap. 17 is an essay pointing out future directions in which economics research regarding the NFL might be fruitful.

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[5] It should be noted that this book was completed during the 2011 NFL lockout, so the details of the final Collective Bargaining Agreement are included only in Chap. 17.

Part I
The Business of the National Football League

Chapter 2
The Economic Structure of the NFL

John Vrooman

We are a bunch of fat cat Republicans who vote socialist on football.

Art Modell, former owner of the Cleveland Browns/
Baltimore Ravens

Asserting that a single team could produce a game is like a Zen riddle: Who wins when a football team plays itself?

American Needle, Inc. v. NFL, et al. 538 F.3d 736
(7th Cir.2009).

2.1 Introduction

Sports leagues are unique in that individual clubs are mutually interdependent in their cooperative production of competitive games. As joint members of natural cartels each sports team is only as strong as its weakest opponent. Over the last half-century the National Football League (NFL) has become the most economically powerful sports league in the world largely because it has also been the most egalitarian. In 2010 NFL clubs pooled and shared two-thirds of over $8 billion in revenues among 32 franchises. The underlying source of NFL economic strength has been a survivalist "league-think" mentality that developed from the outset of the NFL-AFL war 1960–1966. Evenly shared national media money has grown at a compound rate of 12% from $47 million annually at the time of the actual NFL merger in 1970 to $4 billion under 2012–2013 TV contract extensions.

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Over the last 2 decades, however, a major threat to league-thinking solidarity has emerged from an individualist counterrevolution in unshared venue revenue. During the luxury-seat stadium building frenzy that followed the watershed 1993 Collective Bargaining Agreement (CBA), the proportion of team-specific venue revenue has doubled from 10 to 20% of total revenue. This once-tight syndicate now finds itself split into those teams with new venues and those without.

Sports unions are also divisive in that the internal politics of current players are often incongruent with interests of unrepresented future and former players. Professional sports labor markets are horizontally segmented along seniority lines and distinctions between veterans and rookies have become hard and fast seniority requirements for free-agent eligibility. It is common for veteran players to coalesce with management to bargain away the rights of future generations of disenfranchised rookies and forgotten former players. This creates a twisted bilateral monopoly where veteran players are often overpaid because of upper-tier monopoly power, while rookies are exploited because of owners' lower-tier monopsony power. The solidarity of the NFL Players Association (NFLPA) is especially fragmented because of the relatively short careers of NFL players. The unrestricted NFL free-agent eligibility requirement of 4 years exceeds the average NFL experience of 3.8 years. NFL players are now split into a dual labor market where horizontal bargaining coalitions cut across vertical labor-management lines. As a result, CBA outcomes usually reflect the coalition of upper-tier owners and veteran players. In spite of ongoing tension among owner and player segments during the media and venue revenue revolutions in the NFL since the early 1990s, the 1993 CBA was renewed 3 times in 1998, 2002, and 2006 without major confrontation. The 2006 extension was set to expire after 2011 with both sides having options to end the agreement 1 or 2 years early. In 2008 the NFL Management Council (NFLMC) exercised its option by claiming that rising player costs were squeezing profits for small-revenue owners trapped in older stadiums and large-revenue owners who were paying for their new venues.

Initially NFL owners had three proposals. The first was to reduce the players' salary cap revenue base by allowing an 18% increase in new stadium cost credits. This base reduction would cut the players' share of total revenue (57.5% in 2009) by about 10%. The second proposal was largely a divide-and-conquer tactic. The NFLMC sought to strengthen an existing entering NFL rookie draft pool (also a product of the 1993 CBA) by imposing a rookie cap similar to the NBA rookie wage scale. Third, as a hint that media rights fees were beginning to weaken, the owners also wanted to increase the regular season from 16 to 18 games by reducing the preseason from 4 to 2 games.[1] The NFLPA preferred to play under the status quo of the 2006 CBA and questioned whether owners were under financial distress.

[1] This tactic was obviously designed to enhance TV rights package because NFL season-ticket prices already included two preseason games and the marginal cost of annual player contracts is zero. Players countered that they should be paid proportionally more.

The NFLMC threatened a player lockout for 2011, and the fractured League played the 2010 season without a salary cap.[2]

This chapter argues that while the owners' threat of a 2011 lockout was credible, their claims of rising player costs are false and derivative proposals are not justified based on available evidence. The underlying cause of the profit squeeze of NFL owners is the polarizing dynamic of unshared venue revenue available to owners in new venues. Since the 1993 CBA, NFL has leveraged its legalized monopoly power to extort public stadium subsidies, cartelize media rights and gouge gate, venue and media revenue through quasi-perfect price discrimination and vertical integration.[3] The NFL's current economic problem is not between owners and players or even between veterans and disenfranchised rookies. The imbalance diametrically opposes owners of teams playing in new lucrative profit-max venues built since the 1993 CBA and those owners playing in older welfare-max cookie-cutter stadiums of the 1970s. The solution is not for the new CBA to allow greater player exploitation, public venue extortion, and media siphoning. The remedy lies at the source of the cost squeeze: NFL owners should simply share more venue revenue.

2.2 The Media Revolution

The "league-think" solidarity of the NFL was forged in the heat of the rival league war with the American Football League (AFL) 1960–1966.[4] After the NFL-AFL merger was approved by Congress in 1966, the new super-league soon regained its

[2] Three preset safeguards prevented payroll explosion during the uncapped 2010 season. First, free-agent eligibility was increased from 4 to 6 years. This adversely affected 293 players or 21.6% of NFL players with 4–5 years experience in 2010. Second, according to a Final Eight Plan, the eight divisional playoffs clubs in the previous season were limited in the unrestricted free-agents they could sign. The four clubs playing in league championship games could only sign UFAs unless to replace those lost. The four clubs that lost in the divisional Playoffs could only sign one additional UFA after replacing UFAs lost. The first year salary of UFAs signed could not exceed the first year salary of the player lost. Third, the uncapped 2010 season would also be played without a team payroll minimum.

[3] A schizophrenic history of antitrust law has protected the NFL as a natural cartel in the negotiation of TV rights in the *Sports Broadcasting Act of 1961* and as a nonprofit trade association in the Internal Revenue Code 501(c)(6). US Courts have consistently treated the League as several and separate firms. In *American Needle, Inc. v. NFL, et al.*, 560_U.S. (2010)(08–661) the Supreme Court reversed the 7th Circuit's ruling 538 F.3d 736 (7th Cir. 2009) that the NFL was a single entity. The 7th Circuit was the first US Court of Appeals to consider a professional sports league as a single entity.

[4] "League-think" was the business model of former Commissioner Pete Rozelle, "Revenue sharing is the single most effective means of balanced competition in a sports league" The AFL sued the NFL for Sherman Act Section 2 antitrust violation. In *American Football League v. National Football League,* 323 f. 2d 124 (4th Cir. 1963) the Court found that the "fact that the American League was successfully launched, could stage a full schedule of games in 1960, has competed very successfully for outstanding players, and has obtained advantageous contracts for national television coverage strongly supports the District courts finding that the National did not have the power to prevent or impede the formation of the new league" Vrooman (1997).

lost monopoly and monopsony power.[5] Empowered with an antitrust exemption allowing the collective negotiation of TV rights in the Sports Broadcasting Act of 1961, the NFL has become the most economically powerful sports league in the world. Total NFL revenues topped $8 billion in 2009. The average NFL club in 2010 was valued by *Forbes* at $1 billion at a multiple of 4 times revenues of $250 million.[6] The combination of league-wide sharing of negatively correlated win–loss gate revenues, contractually obligated luxury-seat money, long-term media rights fees, and cost certainty from a hard salary cap has made the NFL the "perfect portfolio" diversified through time and across regions.

NFL national television rights have exploded 80-fold since 1970 and the League will take in $4 billion annually in TV rights through 2013. These collectively negotiated fees are about 50% of total revenue and are shared equally among NFL clubs. Gate revenue is 21.6% of NFL total revenue and it is shared 66/34 (60/40 after standard 15% deduction for game expenses) in a straight-pool home/visitor formula (equal visiting team shares after 2002 expansion/realignment). League accounting rules distinguish between local and national revenues (same for each club). National revenue has dropped from 75% at the time of the 1993 CBA to 63% in 2010.[7] The emerging importance of unshared venue revenue from luxury seats has become a chink in NFL solidarity armor. Club seats and luxury suites have driven the venue revolution over the last 2 decades, and unshared venue revenue has more than doubled from 10 to 22.6% of total revenue.

After decertification and legal victory in *McNeil* 1992, the NFLPA recertified and bargained successfully for free agency in 1993.[8] In exchange for free agency the owners imposed a league-wide hard cap on player costs at 64% of defined gross revenues (DGR). The league-wide "hard" payroll cap imposed on NFL player salaries since 1994 creates cost certainty for the owners.[9] The 1993 CBA was extended in 1998 and 2002, but unshared luxury-seat money from the ongoing venue revolution

[5] The AFL-NFL "Merger Act" was an amendment to the Sports Broadcasting Act of 1961, which previously exempted all four major sports leagues from antitrust liability under Sherman Act, Section 1 with respect to the collective negotiation of TV rights. In Congressional merger hearings then NFL Commissioner Pete Rozelle testified, "Professional football operations will be preserved in the 23 cities and 25 stadiums where such operations are presently being conducted," Following the actual 26 team merger 1970 (16 NFL clubs and 10 AFL clubs) the NFL added 2 clubs in 1976, 2 more in 1995 and 1 team each in 1999 and 2002.

[6] Compare other 2009 revenues: MLB $5.9 billion; NBA $3.8 billion; NHL $2.9 billion; and EPL $2.75 billion.

[7] National Revenues include common revenues from National TV and radio, International TV, NFL properties, enterprises and films, and the 34% Visiting Team Share (VTS) of ticket revenues.

[8] NFL's "Plan B" free agency system where a team could protect 37 of 47 roster players was rendered illegal in *McNeil, et al. v NFL*, 790 F. Supp. 871(8th Cir. 1992). After *McNeil* NFLMC and NFLPA reached an accord in 1993 CBA that granted unrestricted free agency after 4 years and restricted free agency after 3 years.

[9] The hard NFL cap can be temporarily avoided by paying players signing bonuses which are prorated over the length of the contract for cap purposes. The prorated bonus carries forward and creates an equivalent amount of "dead cap space" which limits future payroll.

created two revenue asymmetry problems in the 2006 CBA. The NFLPA had a problem with hidden luxury seat money being excluded from the DGR salary cap base, and teams playing in older venues complained about the growing disparity of unshared luxury-seat revenues.

As a compromise the 2006 CBA expanded revenue-sharing base beyond DGR and the salary cap percentage was reduced to 57% of total football revenue (TR).[10] Under the new formula the players received a smaller slice of a larger more inclusive total revenue pie for 2006–2011. (DGR was about 87.5% of TR). The payroll cap was set at $102 million in 2006 (compared to $94.5 million under DGR formula), $109 million in 2007, and $116 million in 2008. The CBA also had a minimum payroll that progressed in 1.2% increments annually from 84 to 90% of the salary cap over the course of the 2006–2011 CBA. Given cost certainty the payroll cap, the NFL became a fully diversified money machine. Unfortunately much of NFL value is extracted by monopoly power over an exclusive fan base and venue extortion power over the general tax-paying public.

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.[11] Collective negotiation of pooled rights fees was justified by Congress because of the natural interdependence of clubs in sports leagues and social welfare from competitive balance. TV rights fees shown in Table 2.1 reveal the long history of the best case for the NFL and worst case for the networks.[12] At the time of the AFL-NFL merger

[10] The cap in 2006 CBA was set at $102 million (2006), $109 million (2007), 57.5% of total revenues in 2008–2009, and 58% 2010–2011. The fail-safe trigger adjustment rate is set at 2 percentage points higher: 59% (2006–2007), 59.5% (2008–2009), and 60% (2010–2011). Minimum payroll ratio increases by 1.2% points each year from 84% of the cap in 2006 to 90% of the cap in 2011 The top 15 revenue clubs agreed to share $430 million 2006–2009 with clubs in older venues whose payroll exceeds 65% their revenue and their gate revenue is at least 90% of the league average.

[11] Eleven teams had contracts with CBS, two 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 NFL and AFL. The first provision of the SBA enacted in 1961 exempts agreement among professional football, baseball, basketball, and hockey teams to pool their sponsored television rights for sale as a package. A second provision of the SBA was passed in1966 to allow the NFL and AFL to merge without antitrust challenge. The antitrust exemption applies to agreements by "member clubs of two or more professional leagues to combine their operations in an expanded single league…if such an agreement increases rather than decreases the number of professional football clubs." The same 1966 act also amended the tax laws so that "professional football leagues are exempt from federal income tax if they are not organized for profit and no part of the earnings inures to the benefit of any individual." In *Shaw v. Dallas Cowboys Football Club*, 171 F.3rd 299 (3rd Cir. 1999) the Court held that the exemption applies only to broadcasts provided free to air and not to satellite broadcasts. The second merger provision of the SBA applies only to professional football leagues.

[12] National rights fees for the NFL since the AFL-NFL merger dwarf MLB and NBA revenues four-to-one. Comparison annual TV rights fees: MLB, $803 million; NBA, $930 million; NASCAR, $560 million; NCAA Basketball Tournament, $565 million; and NHL, $148 million.

Table 2.1 NFL TV right fees

			Total	Annual	Broadcast				Cable		Satellite
Term	Years	Clubs	rights	rights	ABC	CBS	NBC	FOX	ESPN	TBS	DirecTV
American Football League											
1960–1964	5	8	10.6	2.1	2.1	–	–	–	–	–	–
1964–1969	5	10	42.5	8.5	–	–	8.5	–	–	–	–
National Football League											
1960–1961	2	14	0.6	0.3		0.3	–	–	–	–	–
1962–1963	2	14	10.5	5.3	–	4.7	0.6	–	–	–	–
1964–1965	2	14	32	16	–	16	–	–	–	–	–
1966–1969	4	16	98	24.5	–	24.5	–	–	–	–	–
1970–1973	4	26	188	47	8	22	17	–	–	–	–
1974–1977	4	28	218	55	13	24	18	–	–	–	–
1978–1978	4	28	646	162	60	54	48	–	–	–	–
1982–1986	5	28	2,100	420	115	120	107	–	–	–	–
1987–1989	3	28	1,428	476	125	165	135	–	51	–	–
1990–1993	4	28	3,600	900	225	265	188	–	111	111	–
1994–1997	4	30	4,388	1,097	230	–	217	395	131	124	–
1998–1905	8	31	19,600	2,600	550	500	–	550	600	–	400
2006–2011	6	32	22,410	3,735	–	623	600	713	1,100	–	700
2012–2013	2	32	8,130	4,065	–	613	610	743	1,100	–	1,000

TV rights in other leagues: MLB $803 million annually (7 years 2007–2013); NBA $930 million annually (8 years 2008–2016); NASCAR $560 million annually (8 years 2007–2014). Total TV revenues in Big 5 European Leagues $4.45 billion 2008–2009

*CBS, NBC, FOX 2 year extensions 2012–2013; DirecTV "Sunday Ticket" extended at $4 billion 4 years: 2011–2014

ABC was relegated to a prime-time Monday Night Football (MNF) experiment and partnerships established between CBS-NFL and NBC-AFL during the war were continued for the NFC and AFC after the merger in 1970.[13] NFL network affiliations were stable until the emergence of a fourth network FOX as sports rights bidder for NFL TV rights in 1993.[14]

[13] The AFL originally signed a 5-year pooled agreement 1960–1964 with ABC for $2.125 million per season. Immediately following the specific SBA exemption in 1961 the NFL struck an annual deals with CBS for $4.65 million (1962–1963) followed by $14.1 million (1964–1965). In 1964 ABC had bid $13 million and NBC $10 million per year. After losing the 1964 NFL bid, NBC solidified the AFL with a 5-year deal for $36 million plus $6.7 million for postseason. The NBC-AFL deal for $8.54 million per season (1965–1969) was tripled a year later by the NFL-CBS deal for $25 million per season (1966–1969). ABC then found a broadcasting relationship with NCAA college football before acquiring the MNF rights in 1970.

[14] By their own admission NBC and CBS overbid 1982–1986 contracts, when annual fees doubled from to $420 million and lost over $300 million on 1990–1993 contracts which doubled fees again to $900 million.

FOX Network crashed the 1993 NFL TV rights auction by offering $395 million for prized NFC rights, compared to a second-best offer from CBS for $290 million for 1994–1997.[15] The after-shock was delayed until 1998–2005 rights 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 cable affiliate ESPN paid $1.15 billion for Sunday and Monday nights.[16] 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 blew apart traditional network partnerships, annual NFL rights fees more than doubled from $1 billion in 1994–1997 to $2.6 billion 1998–2005. This 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 again increased by 40% and NFL TV siphoning continued. ABC abdicated NFL rights by allowing MNF 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. After siphoning off its TV inventory to cable and satellite platforms, all NFL games were still available for a price, but access was becoming more exclusive through price discrimination and vertical integration.

2.3 The Venue Revolution

If the media revolution over the last half-century has built NFL solidarity, the venue revolution over the last quarter century has served to tear it down. Since the 1995 NFL expansion into Carolina and Jacksonville new or renovated stadiums have been approved for 27 of the 32 NFL clubs.[17] The origins of this venue revolution can be traced to two maverick owners: Joe Robbie of the Miami Dolphins and Jerry

[15] The FOX strategy was to run financial losses and use sports broadcasting to gain legitimacy as a fourth major network rising from its 1986 start-up with a handful of UHF stations. In its first year, FOX outbid ABC for the MNF package in the 1987 rights auction price of $125 million. The NFL chose the incumbent ABC and offered FOX eight Sunday night games that ultimately landed with ESPN for the NFL’s first cable contract 1987–1989.

[16] 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.

[17] San Francisco 49ers $937 million stadium was approved by Santa Clara voters in 2010. Five clubs playing older venues: Miami Dolphins Sun Life Stadium 1987; Minnesota Vikings Hubert H. Humphrey Metrodome 1982; New Orleans Saints Louisiana Superdome 1975; Buffalo Bills Ralph Wilson Stadium 1973; and Atlanta Falcons Georgia Dome 1992. Two clubs paying in older partially renovated Stadiums: Oakland Raiders Oakland Alameda County Coliseum 1995R and San Diego Chargers Qualcomm Stadium 1997R.

Jones of the Dallas Cowboys. After butting heads with the City of Miami and Dade County over renovation of the Orange Bowl, Robbie decided in 1984 to build his own private stadium backed by luxury-seat revenues. The stadium design combined mezzanine club seats of Kansas City Chiefs' football-only Arrowhead with twin tiers of luxury suites in the Dallas Cowboys' football-only 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 prototypical inside-out design was a revolutionary form of spatial price discrimination where lower bowl and upper-deck seating were attached to a luxury-seat *motel in the middle*, rather than the other way around. The revolutionary financial design involved up front 10 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 10 years from annual payments of $16 million derived from luxury-seat revenue alone.

The second split with the cooperative past occurred after wildcat oilman Jerry Jones paid a NFL record $150 million for the Dallas Cowboys and Texas Stadium lease in 1989.[18] During the successful years of the Cowboys in the mid 1990s, Jones set up a series of ambush licensing deals for the Cowboys Texas Stadium that competed directly with the league-wide sponsorship agreements negotiated by NFL Properties (NFLP). NFLP had been created in 1963 as the merchandising element of the Commissioner Rozelle's "league-think" model. The conflicting sponsorships resulted in mutual law suits that successfully challenged NFL collectivism and increased local venue money.[19] The twin suits were resolved with a legal distinction separating NFLP and the Cowboys brand from Jones and Texas Stadium. This subtle separation attached revenue to the stadium and increased unshared cash flow for the individual club that controlled its own venue.

The private funding of Joe Robbie Stadium created a revenue-sharing problem for the rest of the League that was solved when the other owners agreed to waive the visiting team share (VTS) of luxury seats if the fees were used in the construction of the stadium (the premium seat waiver).[20] The VTS waiver was later extended to

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[18] Purchase price included $65 million for 56% of the NFL Club, $75 million for all of Texas Stadium and $20 million for Valley Ranch and deferred salaries. After going 1–15 in 1989, the Cowboys became the NFL's most successful team in the 1990s. Dallas qualified for the playoffs eight times, won six division titles, and won three Super Bowls in 1993, 1994 and 1996.

[19] Jones entered into licensing agreements with direct competitors of NFLP: Nike v. Reebok, Pepsi v. Coke, and American Express v. MasterCard. The NFLP argued misappropriation of NFL property (Cowboy brand) in *NFL Properties v. Dallas Cowboys, Texas Stadium, and Jerry Jones,* S.D.N.Y., 1995, 95 Civ 7951. In *Dallas Cowboys Football Club, Ltd.* v. *NFL Trust*, No. 95-civ-9426 (S.D.N.Y. Oct. 18, 1996) the Dallas Cowboys challenged the teams' agreement allowing NFLP control over their marks. The Cowboys alleged that "[t]he marks of the member clubs are not of equal, or even comparable, value," At the time the Cowboys accounted for one-third of NFL merchandise and twice as much as the second highest team. Jones argued that NFLP exclusive licensing constituted collusion in violation of Sherman Section 1.

[20] Club-seat money is split into club fees and reserve-seat tickets. The ticket portion of the club seat is shared with the league (66/34) as gate revenue while the club fee premium is treated as unshared venue revenue.

personal seat licenses (PSLs) used for venue construction after the Carolina Panthers sold $122 million in PSLs for a 76.3% private funding of Bank of America (Ericsson) Stadium in 1996.[21]

Perhaps the most important factor in the second half of the venue revolution was the League's extension of the premium waiver into the creation of a full blown credit facility for venue finance. After the New England Patriots aborted relocation to Hartford in 1999, the NFL began a G-3 loan program (*NFL Constitution and Bylaws,* 1999 Resolution G-3) where stadium loans were to be repaid from 34% VTS of club seat premiums. The League loaned up to 50% of private costs (maximum $150 million) for teams in six largest TV markets, and up to 34% (maximum $100 million) for clubs in smaller markets. In Table 2.2 the 25 stadiums built since the 1995 expansion are split into venues built during the relocation/extortion period after1995 and the G-3 loan period after 1999.

The G-3 loan program was clearly designed to discourage teams in large TV markets from relocating to smaller markets. Consider the Chicago Bears who contributed less than one-third of the $632 million cost for the New Soldier Field that opened in 2003. Of the $200 million private share, $100 million came from a G-3 loan and $70 million from PSL sales. The Bears actual cash outlay was only $30 million. The G-3 program involves a transparent wealth transfer from the VTS of smaller teams to large market teams playing in new venues. Premium seat waivers and G-3 loans are also excludable from the salary cap base. This is the large market owners attempt to protect TV rights and shift venue cost to the players, and ironically to the smaller revenue clubs.

Since the NFL's $10.8 billion venue revolution began public coffers have been hit for about one-half the cost. The 12 stadiums built under the $1.1 billion G-3 program averaged 59% private share and one-fourth of the private share was from G-3 loans. The 13 stadiums built in relocation/extortion period before G-3 averaged only 26.6% private funding and 60% of the private share came from PSLs. The good news is that the G-3 program was shifting the financing burden to the NFL teams rather than the general tax-paying public, but the bad news was that the internal private burden was being shifted to smaller markets through the premium waiver and to players through stadium cost exemptions from the salary cap revenue base.

In venue deals negotiated during the relocation/extortion derby expansion, the public share of venue cost varies inversely with market size.[22] To see how the NFL

[21] 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 a 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 1995 relocation violated both of these basic principles.

[22] This is because the top half of the League occupies the 16 largest TV markets (1.5 million and higher), while the bottom half is auctioned to the highest public funding bid by the 30 or so mid-markets eager to land a club.

Table 2.2 NFL stadiums since 1995 expansion/relocation ($Millions)

NFL franchise	NFL stadium	Year Open	Total Seats	Luxury Suites	Club Seats	PSL Seats	Total Cost$	Private Cost$	G-3[a] Loan$	PSL Fees$	Private Share
Expansion-relocation											
Jacksonville Jaguars[b]	Municipal stadium[c]	1995	73.0	85	11.2	–	141	20	–	–	0.142
St. Louis Rams[d]	Edward Jones Dome	1995	65.3	124	6.2	53.5	299	0	–	78	0.000
Oakland Raiders[d]	McAfee Coliseum[c]	1995	63.1	143	6.3	39.0	128	0	–	68	0.000
Carolina Panthers[b]	Bank America stadium	1996	73.4	158	11.4	62.5	248	187	–	122	0.763
San Diego Chargers	Qualcomm stadium[c]	1997	71.5	113	7.8	–	78	18	–	–	0.231
Washington Redskins	FedEx stadium	1997	91.7	284	15.0	–	251	180	–	–	0.720
Baltimore Ravens[d]	M&T Bank stadium	1998	69.3	108	7.9	60.2	229	29	–	65	0.127
Tampa Bay Bucs	Raymond James stadium	1998	66.3	195	12.3	–	169	15	–	–	0.089
Tennessee Titans[d]	LP field	1999	67.7	143	9.6	58.2	292	71	–	71	0.243
Cleveland Browns[b]	Browns stadium	1999	73.2	147	8.8	57.0	314	79	–	25	0.252
Cincinnati Bengals	Paul Brown stadium	2000	65.6	114	7.6	58.0	458	44	–	26	0.096
Pittsburgh Steelers	Heinz field	2001	64.5	129	6.6	45.0	284	113	–	37	0.398
Houston Texans[b]	Reliant stadium	2002	69.5	191	8.3	44.0	449	132	–	50	0.331
Extortion totals	13 venues		70.3	149	9.2	53.0	3,340	888	0	542	0.266
G-3 loan program[a]											
Denver Broncos	Invesco at mile high	2001	76.2	124	8.2	–	401	100	48	–	0.250
New England Patriots	Gillette stadium	2002	68.8	80	6.0	–	412	340	141	–	0.825
Detroit Lions	Ford field	2002	64.4	132	8.6	–	500	375	100	–	0.750
Seattle Seahawks	Qwest field	2002	67.0	82	7.7	8.3	430	130	63	17	0.302

Philadelphia Eagles	Lincoln financial field	2003	67.6	172	10.8	29.0	518	330	125	70	0.637
Chicago Bears	New soldier field	2003	61.5	133	8.6	27.5	632	200	100	70	0.316
Green Bay Packers	Lambeau field[c]	2003	71.0	167	6.3	58.0	295	126	13	93	0.427
Arizona Cardinals	University of Phoenix	2006	63.4	88	7.5	–	455	147	42	–	0.323
Indianapolis Colts	Lucas oil stadium	2008	63.0	142	7.1	–	675	100	33	–	0.148
Dallas Cowboys	Cowboys stadium	2009	80.0	320	15,0	66.0	1,200	850	76	470	0.708
Kansas City Chiefs	Arrowhead stadium[c]	2010	77.1	133	10.0	–	375	125	43	–	0.333
New York Giants/Jets	New meadowlands	2010	82.5	217	10.0	55.5	1,600	1,600	300	400	1.000
G-3 totals	12 venues		70.2	149	8.3	40.7	7,493	4,423	1,084	1,120	0.590

[a]After aborted move of New England Patriots to Hartford Connecticut in 1999, the League established the G-3 loan program for venue construction (Amendment 1999 G-3 NFL Bylaws). Using a debt facility backed by TV revenues, the NFL loaned up to 50% of private stadium contribution for top six TV markets ($150 million maximum) and up to 34% of the private share for smaller markets ($100 million maximum). G-3 loans are repaid from visiting team share of club-seat premiums

[b]Expansion teams: Carolina played 1995 in Clemson stadium

[c]Stadium renovations

[d]Relocation teams: ravens played 1996–1997 in Baltimore Memorial Stadium. Titans played 1997 in Liberty Bowl and 1998 in Vanderbilt Stadium. The decision whether Cleveland would get an expansion or relocation team was delayed until after stadium elections in Tampa and Cincinnati

venue extortion game worked, consider the relocation circus surrounding the 1995 expansion. The six finalists in the auction were Oakland, Baltimore, St. Louis, Memphis, Charlotte, and Jacksonville. The first three had lost teams to previous NFL relocation-extortions, but 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.[23] Jacksonville was granted a franchise based on advanced sale of 10,000 club seats for $75 million.

Each of the four other finalists (with venue subsidies still in hand) became immediate relocation targets for existing NFL clubs seeking easy public money for new venues. In 1995 the LA Raiders moved back to Oakland for 100% public renovation of Oakland Alameda County Coliseum (143 luxury suites and 6,300 club seats) and the LA Rams relocated to St. Louis for 100% public funding of the Edward Jones Dome (142 suites and 6,200 club seats). The Cleveland Browns became the Baltimore Ravens in 1996 for 87% public funding of the M&T Bank Stadium (open 1998 with 108 suites and 7,900 club seats) and the Houston Oilers moved to Nashville for 76% public funding of LP Field (open 1999 with 143 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.[24]

The NFL then retro-expanded into Cleveland in 1999 for 75% public funding of the new Browns Stadium with 147 suites and 8,800 club seats.[25] After several delays between competing LA investment groups, the NFL retro-filled the Houston market instead for 71% public funding of Reliant Stadium (191suites and 8,300 club seats) in 2002. The new Cleveland Browns paid an expansion fee of $476 million and Houston Texans paid a premium fee of $700 million to outbid LA[26] This left the second largest US TV market LA without a NFL team. This was not a major problem for two reasons. First, LA teams rarely sold out games especially in the cavernous

[23] 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.

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

[25] Cleveland received a replacement franchise as settlement of a law suit against the NFL over the relocation of the Browns to Baltimore in 1996. The League delayed the decision on whether the Cleveland franchise would be an expansion or relocation club until after 90% public funding was approved in both Tampa and Cincinnati.

[26] Al Lerner paid $530 million for the Browns but $54 million was used to repay the League for stadium loan.

LA Coliseum, and the black-out rule makes LA'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. LA relocation has been used in subsequent threats by the New Orleans Saints, Arizona Cardinals, Indianapolis Colts, and San Diego Chargers.[27]

Several problems emerged during the venue revolution. The first and most obvious was the general shift toward increased reliance on unshared venue revenue. Second, the venue privatization potential discovered by Joe Robbie went into the owners pockets because of the heavy public subsidies that were leveraged through relocation/extortion threats after the 1995 expansion. Third, most of the private team shares of venue costs were financed by exclusionary schemes of personal seat licenses (PSLs) and luxury-seat packages. Take-it-or-leave-it perfect price discrimination has exhausted the consumer-surplus of the marginal fan. Fan-exclusion tactics have become virtually the same in both media and venue revolutions. The NFL league-cartel and its local monopoly teams have charged fewer and fewer fans more and more money for the same all-or nothing season-ticket package. Over a very short period the venue structure of an entire League will have been transformed from multipurpose public stadiums designed for maximum fan welfare to publically subsidized exclusive football-only venues designed for maximum profit.

2.4 Owners Divided

In the wake of the venue revolution NFL Clubs can be divided into distinct revenue quartiles as shown in Table 2.3. Unfortunately for the old-school "league-think" business model these tiers reflect the polarity TV market size and unshared venue revenue. The ordering is based on revenues and franchise values, but the actual quartile segments more closely reflect Value/Revenue multiples (V/R) used in appraising those franchise values. V/R multiples reflect the underlying risk inherent in expected positive and negative cash flows for the 32 clubs. The top eight clubs in League 1 enjoy advantages of greater cash flow from new venues, and they also benefit from its contractually obligated certainty. During the venue revolution it was common practice for NFL owners to trade more risky (high variance) gate revenue for more certain (low variance) venue revenue.[28] The opposite is true of the lower

[27] In lieu of a stadium the Saints get $186.5 million subsidy 2001–2010. Cardinals took a two-thirds public subsidy for new stadium in 2006. Colts received $575 million subsidy for $675 million Lucas Oil Stadium in 2008.

[28] One of the most valuable aspects of NFL venue revenue over gate revenue is its contractually obligated certainty. V/R multiples also reflect league-specific risk on revenue and player costs. Compare the NFL league multiple of 4.0 to MLB 2.5, NBA 2.91, and NHL 2.34 (*Forbes*). NFL ticket demand is relatively price and win inelastic compared to the other leagues because of its 16-game regular season compared to 162 games in MLB; and 82 games in NBA and NHL. NFL demand could become more elastic with a proposed 18-game season.

Table 2.3 NFL ownership quartiles in 2009

Team	TVHH	Value	Rev	V/R	Debt	D/V	Pay	P/R	Gate
League 1									
Dallas Cowboys	2.436	1,805	420	4.30	199	0.110	143	0.340	2.07
Washington Redskins	2.308	1,550	353	4.39	233	0.150	126	0.357	1.57
New England Patriots	2.394	1,367	318	4.30	273	0.200	133	0.418	1.66
New York Giants	3.696	1,182	241	4.90	650	0.550	166	0.689	1.07
Houston Texans	2.051	1,171	272	4.31	199	0.170	150	0.551	0.94
New York Jets	3.696	1,144	238	4.81	755	0.660	160	0.672	1.04
Philadelphia Eagles	2.940	1,119	260	4.30	179	0.160	141	0.542	1.00
Chicago Bears	3.469	1,096	254	4.30	96	0.090	144	0.567	1.05
League 2									
Baltimore Ravens	1.095	1,073	255	4.21	268	0.250	138	0.541	1.13
Denver Broncos	1.477	1,049	250	4.20	147	0.140	142	0.568	1.11
Indianapolis Colts	1.072	1,040	248	4.19	42	0.040	142	0.573	1.02
Carolina Panthers	1.086	1,037	247	4.20	187	0.180	148	0.599	1.02
Tampa Bay Buccaneers	1.784	1,032	246	4.20	144	0.140	118	0.480	1.05
Green Bay Packers	1.330	1,018	242	4.21	20	0.020	147	0.607	0.89
Cleveland Browns	1.534	1,015	242	4.19	152	0.150	125	0.517	0.87
Miami Dolphins	1.536	1,011	247	4.09	404	0.400	150	0.607	1.15
League 3									
Pittsburgh Steelers	1.158	996	243	4.10	249	0.250	146	0.601	0.92
Tennessee Titans	0.996	994	242	4.11	129	0.130	142	0.587	0.87
Seattle Seahawks	1.782	989	241	4.10	119	0.120	125	0.519	0.87
Kansas City Chiefs	0.927	965	235	4.11	135	0.140	111	0.472	0.98
San Francisco 49ers	1.210	925	226	4.09	130	0.140	136	0.602	0.89
New Orleans Saints	0.600	955	245	3.90	124	0.130	150	0.612	0.81
Arizona Cardinals	1.803	919	236	3.89	147	0.160	146	0.619	0.89
San Diego Chargers	1.051	907	233	3.89	127	0.140	150	0.644	0.98
League 4									
Cincinnati Bengals	0.904	905	232	3.90	100	0.110	122	0.526	0.87
Detroit Lions	1.925	817	210	3.89	351	0.430	139	0.662	0.68
Atlanta Falcons	2.310	831	231	3.60	274	0.330	134	0.580	0.91
Buffalo Bills	0.637	799	228	3.50	128	0.160	142	0.623	0.83
St Louis Rams	1.244	779	223	3.49	62	0.080	135	0.605	0.74
Minnesota Vikings	1.707	774	221	3.50	279	0.360	140	0.633	0.83
Oakland Raiders	1.210	758	217	3.49	53	0.070	156	0.719	0.63
Jacksonville Jaguars	0.655	725	220	3.30	123	0.170	133	0.605	0.70
NFL averages 2009	1.688	1,023	250	4.06	202	0.204	140	0.572	1.00

Source: *Forbes* and Nielsen Media; TVHH is Nielsen TV households in millions; dual markets SFO and NY spilt TVHH/2

Rev is revenue in $1000; debt includes stadium debt; V/R is value/revenue multiple, D/V is debt/value leverage ratio; pay is player cost including benefits; P/R is player costs as percent of/revenues; and Gate is team gate ratio to league average gate revenue

In 2009, National revenue was $157.8 million per club; salary cap $128.5 million; minimum payroll $107.8 million; and player benefits were about $23 million. Payrolls can exceed cap because bonus money accrues in year paid and is prorated for the cap and more volatile team-specific revenues of clubs relegated to Leagues 3 and 4. Collective bargaining coalitions between club owners usually sets top-tier League 1 against bottom-tier League 4 with swing coalitions from Leagues 2 and 3. Without direct access to NFL financial records, these data are the best available way (even for the NFLPA) to analyze the NFLMC claims of financial distress.

Exogenous profit pressure could possibly result from the negative cash flow of debt service on a team's private share of venue costs or for the going $1billion franchise price. The NFL owners' goal was to reduce an internally set debt limit from $150 million per club in 2008 to $120 million by 2010. The current level of debt in the NFL is $6.5 billion or $200 million per club (including stadium debt). Leverage ratios and the players' share of revenue are shown in Table 2.3. There are only eight clubs with leverage ratios above the league average of 20% debt/value (D/V) in 2009. Three of those clubs: NY Giants 55%, NY Jets 65% and Detroit Lions 43% used debt to finance their private share of their venues.[29] The other five clubs are still paying down recent acquisition costs for their respective franchises: Baltimore Ravens, 25%; Miami Dolphins, 40%; Pittsburgh Steelers, 25%; Atlanta Falcons, 33%; and Minnesota Vikings, 36%. Based on this evidence NFL clubs do not appear to be overburdened from the "outside" weight of club acquisition or private venue construction costs.

The 2006 CBA extension established a supplemental revenue-sharing (SRS) pool to redistribute $430 million from the top 15 revenue clubs to the bottom 8–12 revenue clubs through 2009. SRS was a modest compromise designed to relieve player cost pressure if the club had a player cost/revenue ratio (P/R) over 65% and receive a full share if its gate revenue was above 90% of the league average (Gate).[30] Based on the NFL benchmark of 65% players' share, there is evidence of an exogenous player cost squeeze for only a handful of teams. NY Jets and NY Giants player costs exceed two-thirds of revenues for their last season played in old Meadowlands. Revenues in the New Meadowlands Stadium (2010) should increase by 20% which will return these ratios to below 60%. One-half of the teams in the League are experiencing player costs above 60% of revenues. Player costs are cyclical in the middle two quartiles, but the squeeze appears to be a burden for clubs in

[29] The NY Jets and NY Giants each borrowed $650 million in addition to G-3 loans of $150 million each to finance the $1.6 billion New Meadowlands Stadium that opened in 2010. The Detroit Lions privately financed 75% (including $100 million G-3 loan) of $500 million Ford Field in 2002. Steve Bisciotti paid $275 in 1999 for 49% and $325 million in 2004 for the remaining 51% of the Ravens, Stephen Ross paid $1.1 billion for the Dolphins in 2008–2009; Arthur Blank paid $545 million for the Falcons in 2002; Zygi Wylf paid $600 million for the Vikings in 2005; Dan and Art Rooney II borrowed $250 million to buyout other Rooney brothers in 2009.

[30] According to the plan $100 million to be distributed for 2006; $110 million to be distributed each year 2007–2009. SRS replaced a pool that previously distributed about $30–$40 million annually. SRS was funded by the league's top 15 revenue teams. SRS was discontinued in the 2010 uncapped season when the owners opted out of the final year of the CBA. Owners in new stadiums were not eligible for 5 years and new owners during term of the 2006 CBA were not eligible. Player costs include benefits of about $23 million per club in 2009.

League 4 and those at the bottom of League 3. A similar pattern with the Gate ratio confirms that player cost pressure in the NFL is due to unequal revenue distribution rather than the player's overall share of the league revenue.

2.4.1 Owners and Players Divided

Since the AFL-NFL merger in 1970 NFL owners have held the greatest monopsony power of the four major North American leagues. NFL players gained unrestricted free agency in the 1993 CBA, but only after the NFLPA had decertified as a union in 1989, sued the NFL in *McNeil* in 1992 and agreed to a hard salary cap.[31] The only threat to the NFL's monopsony power occurred during the rival league war with the USFL 1983–1985.[32] Given the symbiotic relationship between TV and the NFL, new rights contracts are tied to player salary increases. For example, the doubling of salaries during the USFL war 1983–1985 was fueled by a 160% increase in TV rights fees 1982–1986. More recently the doubling of TV rights in 1990–1993 worked together with NFL free agency to create a 38% increase in players' salaries in 1993. The jump of the players' share of total revenue from 57.2% in 1990 to 68.5% in 1993 triggered the NFL salary cap for the 1994 season.[33]

As shown in Table 2.4, since the salary cap began player salaries have risen in sync with each new TV deal, and then remained stable until the next rights auction. This happens because the salary cap and payroll minimum were tied to the contracted TV portion of defined gross revenues (DGR) from 1994 to 2006. In a similar manner, each of the 4 year CBA renewals since 1993 was strategically synchronized with new TV contracts in 1994, 1998, and 2006 (8 year TV deal in 1998 spanned the 2002 CBA).

[31] After 1987 bargaining impasse over unrestricted free agency, the NFLPA decertified in 1989 to remove the NFL owners' labor-law antitrust exemption. NFL's Plan B restricted free agency system where a team could protect 37 of 47 roster players was rendered illegal in *McNeil, et al. v. NFL*. 790 F.Supp.871 (8th Cir. 1992).

[32] NFL average player salary doubled during USFL competition from $120,000 in 1982 to $245,000 in 1985. In *United States Football league v. National Football League,* 644 F. Supp. 1040 (S.D.N.Y., 1986) a jury found that the NFL had violated Section 2 of the Sherman Act, but that the USFL had damaged itself and was entitled to damages of only $1. The NFL successfully argued that the strategy of the USFL was to force an NFL merger. The NFL-USFL war ended with the financial collapse of the USFL, followed by two seasons of frozen salaries for NFL players, a failed NFLPA strike in 1987 and a 5-year collective bargaining impasse through 1992.

[33] The 1993 season was uncapped but the salary cap and payroll minimum would become effective if player costs exceeded 67% of defined gross revenues (DGR). Guaranteed league-wide salary was set at 58% of DGR and the 1994 cap was set at 64% of DGR less league-wide benefits. The cap was set at 63% in 1995–1996; 62% in 1997; 63% in 1998–2001, and 63.5% of DGR in 2002. The minimum team payroll was set at 54% of DGR.

Table 2.4 NFL revenues and player costs

Year	Total Revenue	National Revenue	National Percent	Player Costs	Player Percent	Payroll Cap	Cap Percent	Mean Salary	Percent Change
1989	943	561	59.5	535	56.7	–	–	344	25.5
1990[a]	1,216	834	68.6	639	52.5	–	–	395	15.1
1991	1,158	804	69.4	635	54.8	–	–	463	17.0
1992	1,471	1,082	73.5	842	57.2	–	–	484	4.6
1993[b]	1,745	1,312	75.2	1,196	68.5	–	–	666	37.7
1994[a]	1,819	1,279	70.3	1,079	59.3	969	53.3	628	–5.7
1995	2,142	1,439	67.2	1,219	56.9	1,113	52.0	717	14.1
1996	2,235	1,474	65.9	1,372	61.4	1,223	54.7	788	9.9
1997	2,382	1,531	64.3	1,402	58.9	1,244	52.2	737	–6.5
1998[c]	3,138	2,179	69.4	1,770	56.4	1,572	50.1	993	34.7
1999	3,423	2,301	67.2	2,040	59.6	1,809	52.8	1,056	6.4
2000	3,938	2,502	63.5	2,430	61.7	1,927	48.9	1,116	5.7
2001	4,284	2,716	63.4	2,446	57.1	2,090	48.8	1,101	–1.4
2002[a]	4,944	2,964	59.9	2,774	56.1	2,275	46.0	1,316	19.6
2003	5,330	3,196	60.0	2,894	54.3	2,400	45.0	1,259	–4.3
2004	6,029	3,546	58.8	3,437	57.0	2,579	42.8	1,331	5.7
2005	6,160	3,690	59.9	3,394	55.1	2,736	44.4	1,396	4.9
2006[c]	6,539	3,996	61.1	3,819	58.4	3,264	49.9	1,687	20.8
2007	7,090	4,338	61.2	4,112	58.0	3,424	48.3	1,712	1.5
2008	7,575	4,708	62.1	4,371	57.7	3,734	49.3	1,947	13.7
2009	8,016	5,044	62.9	4,577	57.1	4,064	50.7	1,858	–4.6

Sources: NFL, NFLPA and *Forbes*

Player costs include player salaries and benefits. Benefits increase from 10% of player costs in 1993 to 15% in the uncapped season 2009 ($736 million). National Revenues include common revenues from National TV and radio, International TV, NFL properties, enterprises and films, and the Visiting Team Share (VTS) of ticket revenues. Revenues do not include fees from Houston Texans (2002 expansion fee $700 million) for $150 million in 1999–2003 and $100 million in 2003; Cleveland Browns (1999 expansion fee $530 million less $43 million stadium loan) for $487 million in 1998; Carolina Panthers and Jacksonville Jaguars (1995 expansion fees $140 million each) for $84 million in 1993, $56 million in 1994 and $35 million 1995–1998

[a] TV contracts

[b] CBA and uncapped 1993 season

[c] CBA extension with TV contracts

Much of the current tension among owners was already apparent in the 2006 CBA extension, in which the players received a smaller salary cap slice of a larger total revenue (TR) pie. The payroll cap base was increased from DGR to TR while the payroll cap share was reduced from 64.5% of DGR to 57.0% of TR. This actually resulted in a higher salary cap for 2006 under the new TR formula ($102 million per club) than under the DGR formula that it replaced ($94.5 million). During the current CBA negotiations there has been major confusion about three different definitions of NFL revenue. DGR was essentially the NFL's revenue-sharing base used among its teams. This included all (home and VTS) gate receipts (net of admission taxes and surcharges deductable for purposes of revenue sharing) including ticket

Table 2.5 NFL total revenue lexicon

Year	PAY/TR*	PAY/TR	TR/TR*	PAY/DGR	DGR/TR	DGR/TR*	DGR%	TR%
2000	0.565	0.617	0.916	0.708	0.872	0.798	0.6300	–
2001	0.528	0.571	0.928	0.644	0.884	0.820	0.6300	–
2002	0.519	0.561	0.925	0.636	0.882	0.816	0.6400	–
2003	0.502	0.543	0.922	0.620	0.879	0.810	0.6425	–
2004	0.522	0.570	0.907	0.657	0.875	0.794	0.6475	–
2005	0.505	0.551	0.930	0.623	0.872	0.811	0.6550	–
2006	0.527	0.584	0.903	–	–	–	0.6450	0.570
2007	0.518	0.580	0.894	–	–	–	–	0.570
2008	0.510	0.577	0.883	–	–	–	–	0.575
2009	0.506	0.571	0.886	–	–	–	–	0.575

Source: NFLPA. The payroll cap ratio was scheduled to be 58.0% in 2010–2011
Pay is total player cost including benefits (15% of total costs in 2009); TR* is all NFL revenue; TR is TR* after stadium cost credits; DGR includes gate and media revenue and excludes venue revenue: DGR% cap share for DGR; TR% cap share for TR

revenue from luxury suites and club seats subject to gate sharing among NFL teams, and radio and TV broadcast revenue.

Venue revenue was therefore excluded from DGR, but is partially included in Total Revenue TR, which includes concessions, parking, sponsorships, club fees, and luxury-box income (PSL revenues were included in DGR and TR unless they were used in venue construction). So in effect the players after 2006 were given a share of local revenues not available to other teams in the League. The current CBA problem concerns stadium credits that are still allowed as deductions from local revenue "to the extent that such revenues are used to pay for or pay financing costs for the construction of a new stadium that increases TR."[34] The NFLMC prefers to discuss the players' cost share in terms of its percentage of TR (including deduction for stadium costs), whereas the NFLPA frames the players' share as a portion of "all revenue" before credits and deductions (TR*).

As shown in Table 2.5, DGR was stable at 88% of TR and 80% of TR*from 2000 to 2006, but TR has declined from 93% of TR* in 2005 to 88.6% in 2009. The players' share of revenue by all definitions fell by at least 5% between 2000 and 2002, and then recovered slightly after a brief bump from the 2006 TR formula. After 2006 the players' share stayed the same relative to TR and declined compared to TR* (TR* increased relative to TR). The NFLPA argues that their current share of TR is 57% of $8.016 billion after cost deductions, but that the players get only one-half of "all revenue" TR* equal to $9.047 billion before cost deductions. The NFLMC has proposed an additional 18% in stadium cost credits, while the

[34] Accounting rules for DGR before 2006 and TR thereafter allow expense deductions for cost of goods sold, luxury-box and club-seat depreciation, and reasonable advertising expenses for internet and satellite TV.

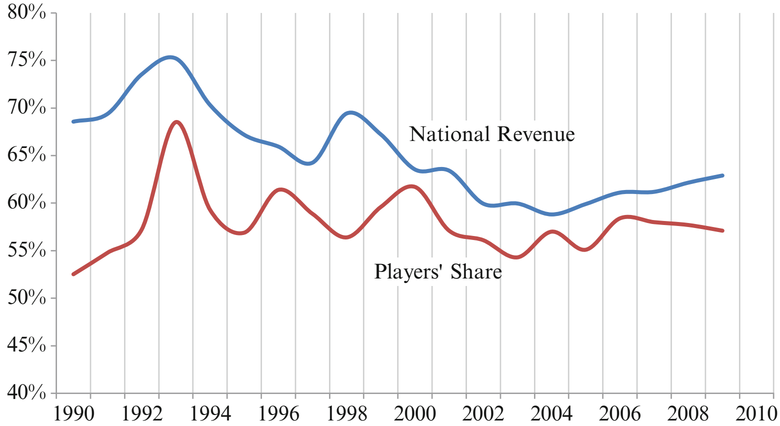

Fig. 2.1 NFL national revenue and players percent of total revenue

NFLPA counters that the owners already have taken over $1 billion in expense allowances. The owners' proposal would reduce player costs by 18% and cut the players' share of TR by 10% to less than 50%.[35]

Perhaps the most important *non*event found in Tables 2.4 and 2.5 and shown in Fig. 2.1 is that the players' share has been consistently below 60% of TR since 2000 when the G-3 loan program began.[36] The most telling collateral discovery is the clear downward trend in NFL national revenue from 75% of TR in 1993 to 63% in 2009. This is strong evidence that the profit squeeze for teams in the lower quartiles the NFL is a direct result of the increase in unshared venue revenue for the upper tiers of League owners, rather than rising pressure from overall player costs.

[35] The cost-credit proposal is similar to that of the 2005 NHL CBA where all existing player contracts were rolled back by 24% to lower the player share from 75% before the 2004–2005 lockout to 57% of Hockey Related Revenues (HRR) by 2005.The 6-year NHL deal that runs through 2011 specified a hard salary cap that limits the players' share to 57% of HRR. The difference is that NFL player costs are already at 57% of TR not 75%.

[36] Player cost shares of revenues are similar in all four major sports leagues. Vrooman (2009) argues that, "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%." Zimbalist (2010, 25) concludes, "The tensions experienced in the NFL since the 2006 move to using TR as the cap base suggest a possible disadvantage to the cap system, namely unequal club revenues. If all teams are compelled to have payrolls with a certain narrow range, and such range is determined based on league-wide revenues, then markedly unequal rates of profit across clubs may be the result."

2.5 Players Divided

Since the landmark 1993 CBA the owners have publically negotiated in the media for a rookie "cap within the cap" that pits veterans and retired players against "unproven" rookies in a divisive zero-sum game for what has become a relatively insignificant sum:

> One of management's biggest concerns is the exorbitant and inefficient spending on rookies. Our current system of paying rookies doesn't make sense. In 2009, 256 drafted rookies signed contracts calling for $1.2 billion in compensation with $585 million guaranteed. This year (2010) the numbers increased to $1.27 billion, including $660 million guaranteed for 255 draft choices. Our management negotiating team has proposed a common sense wage scale similar to the entry level scale for players in the NBA and NHL. We estimate that a rookie wage scale would free up more than a billion dollars during a 5 year agreement. That money would be redistributed to veterans and retired players.[37]

The NFLPA response has consistently opposed player salary controls at any level.[38] In the current negotiations the Players proposed modifying the existing Performance-Based Pool system that was negotiated in the 2002 CBA extension (Article XXXVIII-B).[39] In the NFLPA proposal rookie contracts would be cut to a maximum of 3 years. This would reduce the risk that clubs face of overpaying high draft choices, and it would let underpaid players negotiate market-level deals sooner. The NFLPA estimated this would save $200 million. $150 million would go to a *Proven Performance Fund* that rewards rookies and veterans who had previously signed contracts below their market value, and $50 million (matched by $50 million from owners) for $100 million per year that would go to retired players. NFL owners were unwilling to guarantee that rookie savings would go to veterans, and they rejected the NFLPA proposal.

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[37] "Under our (NFLMC) proposal mandatory contract lengths would be 5 years for first round players (6 years for quarterbacks), 4 years for 2nd –7th round picks and 3 years for undrafted rookies. First round contracts could be renegotiated after 3 years and after year two for all other rookies. Under the proposal the first pick would sign a 5-year contract for $5.34 million bonus and $1.5 million salary his rookie year. In years 2 and 3 his salary would be $1.7 million and $1.9 million. His fourth and fifth year would rise to $2.3 million and $2.9 million for a package of $15.6 million. If he was quarterback he would be paid $4.3 million in year six." Mark Murphy (2010), president of the Green Bay Packers and member of the NFL owners' bargaining committee.

[38] Former NFLPA executive director Gene Upshaw argued that any salaries gained by the rookies ultimately trickle up to the veterans who renegotiated their contracts, and that nonmarket controls on rookie salaries would allow the League to keep four or five rookies because it's cheaper than keeping one or two veterans.

[39] In the last uncapped season 2009, the performance-based pool made up $109.5 million of about $736 million in total player benefits. The fund began at just over $15 million in 2002 and was reset at $96 million ($3 million per club) in 2006, when the fund's growth was also capped at 5%. A player's PBP Index is the ratio of his playing time percentage to his PBP compensation (his salary plus prorated bonuses). Each player would receive an allocation determined by dividing his PBP Index by the sum of his team's PBP Indexes and multiplying that by his clubs total PBP allocation. The top 25 payouts in 2009 ranged from $250,000 to $400,000.

Currently the overall salaries of drafted rookies for each NFL team have been constrained since the 1993 CBA by an Entering Player Pool (Article XVII).[40] In 1993 the rookie pool was originally set at $56 million or $2 million per club and was increased to 3.5% of DGR for the first capped year 1994. After 1994 the pool was initially allowed to grow at the same annual rate as DGR until the 1998 CBA, when pool growth was limited to 10%. Beginning with the 2002 CBA the entry pool was frozen for 2002–2003 and held to 5% growth thereafter. As a result the rookies' share of the salary cap was cut from 6.5% in 1997 to 3.7% by 2009. In 2009 rookies made up 16.4% of NFL rosters but the rookie share was limited to just 2% of total revenue, leaving 55% for veteran players.[41] Compared to the exaggerated League figures cited above the entire rookie pool was only $150.755 million in 2009 compared to a $4 billion salary cap, and it was increased to $155.995 million for the uncapped 2010 season. Most of the anti-rookie rhetoric concerns the going market rates for first round picks, especially quarterbacks. But given the zero-sum nature of the already shrinking rookie pool, gains for first rounders come at the expense of players drafted in later rounds rather than from veteran players. In 2009 one-half of the rookie draft pool was spent on first and second round picks.[42] After the first round, players drafted in rounds 2–7 usually sign 3- or 4 year minimum salary contracts ($310,000 in 2009) that are augmented with market signing bonuses.[43]

Unfortunately because of the smoke-and-mirror misdirection tactics used in public negotiations there is major confusion (public and private) in the discussion of NFL player salaries. Unlike NBA and MLB contracts, NFL player contracts are not automatically guaranteed, and when guarantees are specified, even the best rookies and veteran players are not always protected from being cut for skill, injury, or salary cap reasons. Consider for example, the contract of University of Georgia quarterback Matthew Stafford, the first overall pick of the Detroit Lions in 2009. Stafford's contract was reported in the media to be for $72 million over 6 years with $41.7 million guaranteed.[44]

[40] Entry pool allocations are different for each team based on number and position of draft picks.

[41] Experience distribution in 2009: 0 years 16.4%; 1 year 14.6%; 2 years 12.8%; 3 years 12%; 0–3 years 55.8%.

[42] In 2009 first round players received 36.2% and second round picks took 14.5%. In 2009 the Detroit Lions paid cap salaries for 3 of the first 33 draft picks (1, 20, and 33) equal to 65.6% of their $8.074 million rookie pool allocation, including 38% on first overall pick Matthew Stafford.

[43] Under the most recent 2006 CBA a rookie's first contract could not exceed 4 years unless he was drafted in the first round. The first 16 picks were limited to 6 years and picks 17–32 were had a max of 5 years. First year salaries (calculated like Article XXIV salary cap using base salary and prorated signing bonus) for all players must fit within a team's rookie pool allocation. The maximum raise for any season is 25% of the first year's salary and rookie contracts cannot be renegotiated until after the second season.

[44] The first pick in the 2008 draft quarterback Matt Ryan signed a 6-year contract with the Atlanta Falcons for $72 million, $34.75 million guaranteed, and the first pick in the 2010 draft, quarterback Sam Bradford signed a 6-year deal with the St. Louis Rams for $76 million with $50 million guaranteed.

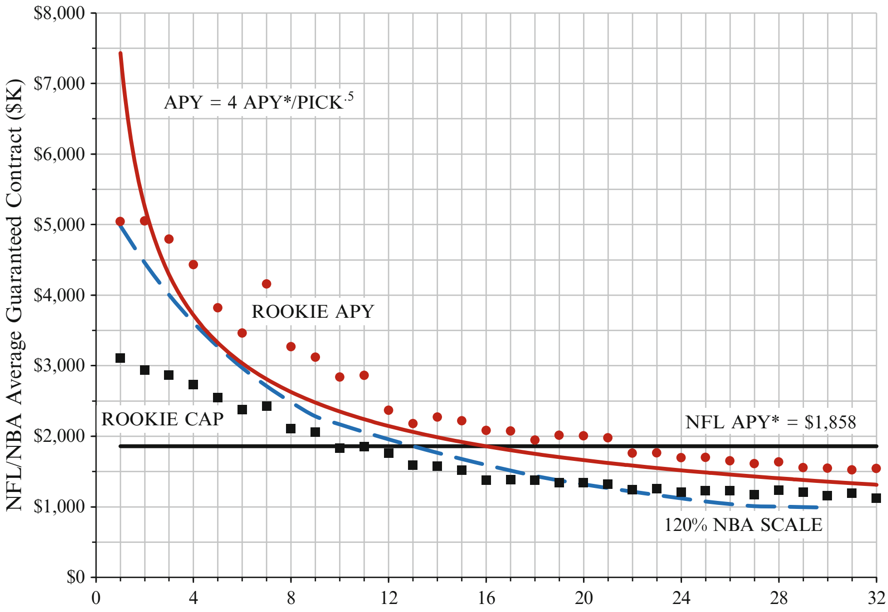

Fig. 2.2 NFL/NBA first round pick comparison 2009

The apparent equity problem was that without playing a down in the NFL, Stafford would be paid more than League-MVP quarterback Tom Brady who was in the fifth year of a 6 year (2005–2010) contract with the New England Patriots for $60 million ($26.5 million guaranteed). In reality Stafford's only full guarantee was his base salary of $30.225 million for an average base per year (APY) of $5.0375 million.[45] Stafford's 2009 salary cap number was $3.1 million for the Lions compared to Brady's $14.627 million cap hit for the Patriots. More importantly at the start of the 2010 season, Brady used the leverage record of first round rookie quarterback deals to negotiate a 4 year extension worth $72 million ($18 million APY), of which $48.5 million was guaranteed.[46]

As the result of the relatively high salaries for rookies selected in the top half of the first round the NFLMC has proposed a rookie slotting scale similar to the NBA. To see if additional NFL salary controls are needed, NFL rookie APY's (circles) and salary cap numbers (squares) for 2009 first round picks are compared in Fig. 2.2 to the NBA rookie 120% scale for 2009–2010 (dashed line) as specified in the

[45] Stafford's minimum salary cap numbers equal his expected base salary plus prorated option bonus of $3.48 million 2010–2014. Minimum cap hits 2009 $3.1 million, 2010 $3.875 million, 2011 $4.65 million, 2012 $5.425 million, 2013 $6.2 million, and 2014 $6.975 million; total $30.225 million.

[46] Brady had $6.5 million left on previous contract for 2010 which brought 5-year total to $78.5 million. Only $28.3 million is "fully guaranteed" against being cut for "skill, injury, and salary cap" reasons.

NBA CBA.[47] It is clear that only those players in the top half of round one received APY contracts above the NFL average salary (APY*) in 2009 and only the top 10 picks had first year cap numbers above APY* of $1.858 million.

Also shown in Fig. 2.2 is a hypothetical power rule (solid line) that reflects the reward structure inherent in the relative value of first round talent.[48] The inverse power rule specifies that talent naturally varies inversely with the square root of the pick: $APY = 4(APY^*)/PICK^{1/2}$, where APY* is the average NFL salary and APY of the first pick is 4(APY*) (this sets the 16th pick is equal to APY*). It is not surprising that first round NFL rookie APY's and cap numbers both behave in accordance with the inverse power rule, but it is remarkable that same is true for the NBA rookie scale.[49]

This evidence leads to two simple conclusions concerning the proposed rookie cap. First, the NFL entry pool has already been squeezed to less than 2% of total revenue and now it serves as an effective control over the balance between rookie and veteran salaries. There is also evidence that negotiating market rate rookie salaries positively influences the renegotiation of veteran contracts. Second, the distribution of individual contract prices within the rookie pool efficiently reflects the underlying distribution of talent. Additional salary controls in the NFL rookie draft would only magnify the inefficiency inherent in NFL owners' considerable monopsony power.[50]

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[47] NBA rookie contracts are usually signed for the maximum 120% of the scale that is specified in the CBA since 1995. Each NBA rookie scale contract for a first round pick covers two seasons with a club option for the third and fourth seasons. A team may sign a player between 80 and 120% of the scale salary figure. Teams can provide this amount using the Rookie exception, even if they are over the salary cap. Annual raises are limited to 8%, and can't exceed 120% of the scale amount for that season. The percentage increase for the third and fourth option years varies by the player's draft position. Teams have until the player's second season to use their option for the third season and until the third season to use their option for the fourth season. If the team uses both options and keeps the player for four seasons, then the player is a restricted free-agent after his fourth season. If the team declines either option, then the player is an unrestricted free-agent.

[48] The Dallas Cowboys draft-day trade value chart first used in the 1990s follows a similar power rule.

[49] In results not shown here the inverse power rule also holds for the NHL's entry level system after performance bonuses are paid. In the *NHL Entry Level System:* All group 1 players (rookies) face the same maximum annual compensation depending on year drafted ($925,000 in 2011). Players 18–21 years old are covered by the Entry Level rules for 3 years, players 22–23 are covered for 2 years, players 24 are covered for one and players who are 25 years and older are not subject to limits. A signing bonus cannot exceed 10% of annual compensation. Players can receive Individual "A" performance bonus up to a maximum of $212,500 each $850,000 total; Individual "B" League-wide performance bonuses payable by the League and/or club up to a max of $2 million per season. As the first overall pick for the 2005–2006 season Sidney Crosby earned a $765,00 salary and $85,000 bonus (10%) for the maximum compensation of $850,000 stated in the 2005 CBA plus: the maximum $850,000 in Individual "A" bonuses, the maximum of $2 million in Individual "B" bonuses from the Pittsburgh Penguins and $400,000 bonuses from the League for total compensation of $4.1 million in his first season. After three seasons in the entry level system, Crosby received $9 million in 2009–2010.

[50] If NFL owners are concerned about efficiency then it makes more sense to reduce max contract lengths from 6 years for the top of round one (picks 1–16), 5 years for the bottom of round one (picks 7–32) and 4 years for players taken after round one (rounds 2–7) to 5, 4, and 3 years, respectively. In the NBA rookie scale system all 1st round contracts are for 2 years with team options for the third and fourth years. It is questionable whether NFL teams are entitled to recover player development expenses that have been shifted to the NCAA.

2.6 Rule of Reason

Unfortunately the most recent rounds of collective bargaining between the NFLMC and NFLPA have been reduced to public posturing in the media, lobbying in Congress and legal maneuvering in the courts.[51] In the most important legal decision since *McNeil* (1992) the US Supreme Court recently recognized the basic duality of NFL competition and cooperation in the *American Needle* case.[52] American Needle, Inc. successfully argued that an exclusive 10 year agreement between NFL Properties (NFLP) and Reebok in 2000 violated Sherman Act Section 1 (conspiracy). The decision was a victory for the NFLPA because the players wanted to retain the tactical threat of decertifying and suing the League as a cartel in violation of Section 1 (successful tactic in *McNeil*). *American Needle* was a loss for NFL owners (as well as owners in other sports leagues) because they were seeking a blanket exemption from antitrust law. The NFL argued that it should be considered a single entity, and therefore it could not conspire under Section 1. The Supreme Court found otherwise:

> The fact that NFL teams share an interest in making the entire league successful and profitable, and that they must cooperate to produce games, provides a perfectly sensible justification for making a host of collective decisions. Because some of these restraints on competition are necessary to produce the NFL's product, the Rule of Reason should apply and teams' cooperation is likely to be permissible…. But the activity at issue in this case is still concerted activity covered for Section 1.

The Rule of Reason simply means that the legality of League activity must be judged based on the balance of its anti- and pro-competitive effects. An agreement is unlawful if the anticompetitive damage outweighs the pro-competitive benefits. In a similar way the NFLMC and NFLPA should strike a reasonable bargain that finds the lance between the competitive and cooperative nature of the NFL. Anticompetitive siphoning of NFL games allowed by the SBA's exemption of collective negotiation of media rights must be weighed against the pro-competitive distribution effects of the equal sharing of media revenue. Anticompetitive price discrimination and exclusion of the NFL fan base through luxury seat and PSL pricing schemes, should be weighed against the welfare efficiency gains of private stadium construction over public venue extortion.

[51] Former player Gene Upshaw was the executive director of the NFLPA for 25 years until his death in 2008. Upshaw was succeeded by outsider and Washington lawyer and lobbyist Demaurice Smith in 2009.

[52] In *American Needle, Inc. v. NFL, et al.*, 560_U.S. (2010)(08–661) the Supreme Court reversed a lower court finding that the NFL was a single entity: 538 F.3d 736 (7th Cir. 2009). The 7th Circuit was the only US Court of Appeals to consider a professional sports league as a single entity. The case concerned the exclusive contract in 2000 between Reebok and NFL Properties. NFLP was created in 1963 as the marketing arm of the NFL. Between 1963 and 2000 NFLP granted nonexclusive licenses to vendors, including American Needle, Inc.

It is also reasonable for NFL teams to cooperate financially with revenue sharing while they aggressively compete in the market for football talent. Player cost pressure in the NFL is the direct result of competition among owners, and almost all NFLMC proposals are intended to protect owners against internal competition among themselves. On the demand/revenue side the NFL is economically the most powerful sports league in the world, and on the supply side it is protected by cost certainty of the salary cap. The erosion of monopsony power by competition among sportsman owners is an efficient positive-sum move. Over the last 20 years the player share of revenues has approached 60% or higher in all of the major sports leagues (Vrooman 2009). The major problem that now faces the League is the equitable redistribution of those costs among its owners.

The players received a favorable and fair CBA deal in 2006 almost by accident. Now they are understandably satisfied with the status quo, while the owners want to take it back. Before 2006 the players received 64% of DGR which is essentially gate and media revenue, while the League owners shared all of media revenue and 34% of the gate. So the revenue-sharing bases were roughly the same for owners and players. After 2006 the players agreed to a smaller share of a larger pie when they received 57% of TR (DGR plus venue revenue minus stadium cost credits). Meanwhile the League revenue-sharing formula remained the same: equally split media and 34% of gate revenue. So when venue revenue asymmetrically exploded during the venue revolution, player costs increased more slowly than the revenues of the upper-tier Leagues 1 and 2 clubs and more rapidly than revenues of teams in lower-tier Leagues 3 and 4. The obvious solution is to match the revenue-sharing bases of the players' salary cap and the League's national revenue by including more venue revenue in the League's revenue-sharing formula.

Zen koan: 'Who wins when a football team plays itself?' Answer: No one.

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Chapter 3
NFL Franchise Values, Locations, and Stadium Economics

Jason Winfree

3.1 Introduction

The NFL is clearly one of the most successful sports leagues in the world. The value of the franchises and the amount of consumer surplus generated illustrate this fact. Over the past 2 decades profits have dramatically increased. Forbes estimates that in 2010 the 32 teams combined are worth over $32 billion dollars. Media contracts have been growing at a very rapid pace and bigger stadiums are being built, as evidenced in Dallas and New York.

The NFL knows how to leverage this value to fans. While the sports economics literature shows that the financial impact of an NFL team is small, it is clear that NFL teams have a large impact on the local community. Many fans have a high consumer surplus with regards to the presence of their favorite team. Given the viewed importance of some of these teams, they can change public policy and use that to their advantage. The combination of high demand and the NFL's monopolistic structure has allowed teams to credibly threaten to move in order to get their stadiums built.

Most NFL stadiums are financed with a mix of public and private dollars, although some are built completely with public money. Contracts and stadium rights vary quite dramatically from team to team, and therefore so do teams' valuations. Public or private bonds may be used and various leasing arrangements are also used. City, county, and state taxes are all used to generate fund for these stadiums. Personal seat licenses are also commonly used by the team to fund stadiums.

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Because many of the stadiums are becoming larger with more luxury seating, stadium revenues are changing. Less revenue, percentage wise, is coming from traditional ticket sales and more revenue is coming from luxury seating, advertising, and sponsorship. In addition, with new huge stadiums being built in Dallas and New York, owners of some NFL teams are seeing a larger percentage of their revenues coming from non-NFL events in their stadiums.

3.2 Franchise Values

Quirk and Fort (1992) give a useful history of NFL franchise values from the 1920s to 1990. Coincidentally, this is when popular business publications began estimating NFL team values. As Quirk and Fort show, NFL team values have risen considerably since the 1920s. The average return from 1920 to 1990 was about 20% (page 63). In 1926, the Duluth Kellys (later the Washington Redskins) were bought for $1 and liability of the team's debts. Given this, complicated financial theory is not needed to see that values have dramatically increased, even compared with other investments.[1] However, this chapter mainly focuses on the last 20 years of NFL values.

While there have been a few studies on sports franchise value, many of them have focused on Major League Baseball (Miller 2007; Fort 2006). One reason for this might be the homogeneity of NFL franchises. With salary caps and a high amount of revenue sharing, there is not as much difference in the relative values of NFL franchises. Therefore, it is harder to find team specific determinants. However, Alexander and Kern (2004) find that team performance is important for NFL franchise values. Variables such as regional population and a new stadium do not significantly increase values in the NFL like it does in other professional sports leagues. Again, one possible explanation for this is that the NFL has more revenue sharing than other leagues, therefore an increase in stadium revenues or even a strong television audience does not help the team as much.

Franchise values in the NFL are difficult to calculate for two reasons. First, financial data is not readily available for most teams (Humphreys and Modello 2008). Most teams are privately owned and therefore revenues and costs can only be estimated. While much of their revenue comes from national television contracts and are known, there are other revenue streams that are not known. Without this crucial data, we can only estimate values using our financial models. An exception is the Green Bay Packers, which is owned by the community of Green Bay. Their financial data are publically available (e.g., Sandomir 2011).

[1] Since Forbes estimates the 2010 value of the Washington Redskins to be $1.55 billion, the nominal yearly return over 83 years is 28.6%.

The second reason NFL franchise values are difficult to calculate is that individual teams are becoming simply one piece of larger entertainment empires. It is becoming more and more common to create other non-football revenue streams from the NFL franchise. For example, Jerry Jones recently built a massive stadium for the Dallas Cowboys. However, this new venue has also had college football games, an NBA all-star game, music concerts, and other functions. While the revenues from these events do not come from the Cowboys directly, it is unlikely that Jones would earn them without an NFL team, so the true value of the team is difficult to gauge, as is any consumption value accruing to Jones from owning the Cowboys. Thus, the value may also depend entirely on who owns the team and what their other holdings are. However, because of stricter ownership policies, this trend is actually slower in the NFL than other major North American sports leagues.

This paper will compare and contrast four different ways of estimating their value. These methods are using actual sale data, Financial World and Forbes valuations, a multiple earnings approach, and risk-adjusted present value models. There are strengths and weaknesses for each of these methods.

3.2.1 Sale Prices

The obvious strength of examining actual sale prices is that this is what people are willing to pay. These values should include any ancillary benefits as well as any consumption value. Ultimately, any company is worth what investors are willing to pay. The drawback of using actual sale data is that we do not have many observations and the sale price of one team may not be transferable to other teams. Furthermore, the exact structure of the sale might not be known and even if it is known, it is difficult to separate the team from other things like the stadium, land, or other assets related to the team.

Table 3.1 shows NFL franchise sales over the last 20 years, which includes 26 sales since 1991. As the limited details of these transactions show, NFL teams can be part of a relatively complicated ownership structure. For example, the ownership percentage sold is not even known for the 2009 partial sale of the Pittsburgh Steelers. Nevertheless, the last column in Table 3.1 creates an estimated value of the team by taking the sale price divided by the percentage sold.

It is easy to look at Table 3.1 and see that values have increased. The interesting question is by how much. With only 25 implicit team values it is difficult to obtain a robust analysis, but it is possible to estimate growth rates. By logging the estimated franchise values we can calculate the growth rate by using time as our only explanatory variable. Therefore, we will use the following model,

$$\ln(\text{value}) = \beta_0 + \beta_1 \text{YEAR} + \varepsilon$$

Running a basic OLS regression (and assuming YEAR = 1 in 1991) gives us the results in Table 3.2. This basic analysis shows a 14.17% rate of growth. In 1991, the

Table 3.1 Actual sale prices of NFL teams

Year	Team	Cost in millions	Buyer	% of team bought and further details	Implied value of team in millions
1991	New York Giants	75	Robert Tisch	50%. Forbes 2004 says $150 million	150
1991	Minnesota Vikings	52	Mike Lynn/Syndicate	51%	101.96
1993	Carolina Panthers	140	Jerry Richardson/Group	Expansion fee. Forbes 2004 says $206 million	140
1993	Jacksonville Jaguars	140	Wayne Weaver	Expansion fee. Forbes 2004 says $208 million	140
1994	Miami Dolphins	109	Wayne Huizenga	85% (to 100%), 50% ProPlayer Stad (to 100%), plus $15 mil assumed debts. Forbes 2004 says 1993, $138 million	128.24
1994	Philadelphia Eagles	185	Jeff Lurie	Plus $8 million assumed liabilities	185
1994	New England Patriots	158	Robert Kraft		158
1995	Tampa Bay Buccaneers	192	Malcolm Glazer		192
1995	St. Louis Rams	60	Stan Kroenke	30%; option on another 10%. Forbes 2004 says $200 million	200
1997	Baltimore Ravens	32	Art Modell	9% (to full 43%)	355.56
1997	Seattle Seahawks	200	Paul Allen	Forbes 2004 says $194 million	200
1998	Minnesota Vikings	206	Billy Joe McCombs	96%, plus $40 mil assumed debts	214.58
1998	Cleveland Browns	476	Al Lerner & Carmen Policy	Expansion fee. Forbes 2004 says $530 million	476
1998	St. Louis Rams	20	Stan Kroenke	10% (to 40%)	200
1999	Baltimore Ravens	275	Stephen Bisciotti	49%; right to buy balance in 2004 for $325 millions Forbes 2004 says 2000 and just lists the $600 million total	561.22

1999	Washington Redskins	800	Daniel Snyder/Group	Incl. FedEx Field, practice facility, and $495 million debt. Forbes 2004 says $750 million	800
1999	Houston Texans	700	Bob McNair	Expansion fee	700
2000	New York Jets	635	Robert Wood Johnson IV		635
2001	Atlanta Falcons	545	Arthur Blank		545
2002	Atlanta Falcons	27	Joe Gibbs, John Imlay, Jr., and John A. Williams	5%	540
2003	Washington Redskins	200	Fred W. Smith/Dwight C. Schar/Robert Rothman	20%	1,000
2004	Baltimore Ravens	325	Stephen Bisciotti	Remaining 51% after original 49% purchase in 1999	637.25
2005	Minnesota Vikings	600	Zygmunt Wilf Group	Wilf lead investor; brother Mark, cousin Leonard, Reggie Fowler, Alan Landis, and David Mandelbaum limited partners	600
2008	Miami Dolphins	550	Stephen M. Ross	Half of each of the team, land, and Dolphins stadium, less any debt. Announced February 24. Pending	1,100
2009	Pittsburgh Steelers	250	Dan Rooney and son Art Rooney II	Percentage not known	-
2009	Miami Dolphins	550	Stephen M. Ross	45% more of the team only takes ownership to 95%. Calculated from $1.1 billion claim on Ross's total deal (see 2008)	1,222.22

Table 3.2 OLS estimation of NFL sales

Parameter	Estimate
Constant	4.6546*** (0.1417)
YEAR	0.1417*** (0.0144)
R^2	0.8088
N	25

*** Statistical significance at the 1% level

estimated value of a team was $121 million and in 2009 it was $1.552 billion. If the analysis includes a squared time trend, the rate of growth is actually estimated to be slowing down, but that effect is not statistically significantly at the 5% level.

A return of 14.17% in nominal terms over an 18-year period is quite high. In fact, the rate of growth of the Dow Jones Industrial Average from January 1, 1991 to January 1, 2009 was 9.40% and for the NASDAQ it was 8.33%.

3.2.2 Financial World and Forbes Data

Another source of franchise valuation data is from *Financial World* (1991–1997) and *Forbes* (1998–present). The strength of the *Financial World/Forbes* data is that they provide estimated values for every team for each year. Also, they endeavor to incorporate other relevant information, such as the stadium contracts, as additional inputs to their valuation algorithms. Unfortunately, the specifics of those algorithms are not made public, and remain a "black box" for other researchers. For example, payments for a new stadium could affect revenues in various ways, but it is not entirely clear how *Forbes* handles this. Furthermore, it is not clear that the revenue data that *Financial World/Forbes* uses is reliable.

Table 3.3 shows the *Forbes* valuations for 2010 and various growth rates for each team using both *Financial World* and *Forbes* series.

These data show an 11.38% return over the 20-year period. This growth is different from the growth rate of actual sale prices, because this growth rate is over a slightly different time span (no sale prices are available for 2010), it includes each team for each year, and the estimates might be different from actual values. What is notable about the *Financial World/Forbes* values is the lack of variability from team to team. The most valuable team is the Dallas Cowboys at $1.805 billion and the least valuable is the Jacksonville Jaguars at $725 million. While the disparity seems to be slightly increasing, for other North American sports leagues, the relative variation is much higher. However, it is important to remember that most of the revenue is from national broadcasting agreements that are shared equally among the teams. Figure 3.1 shows the average Financial World/Forbes values from 1991 to 2010.

Figure 3.2 shows the average growth rates over time from the Financial World/Forbes data.

This graph actually tells an interesting story of recent NFL economic history. First, there is a spike in 1994. This is the year NFL owners successfully negotiated a salary cap. There is a larger spike around 1998 and 1999. Revenues from media contracts skyrocketed during this period. The revenue from media nearly doubled in

Table 3.3 Financial World/Forbes valuation

Team	2010 value (in millions)	Growth rates 1 year (%)	3 year (%)	5 year (%)	10 year (%)	19 year (%)
Atlanta Falcons	831	−2.92	1.44	3.79	9.98	11.08
Baltimore Ravens (Browns)	1,073	−0.56	3.60	4.43	8.40	11.11
Buffalo Bills	799	−12.10	−0.90	2.45	8.15	10.23
Carolina Panthers	1,037	−1.14	2.75	3.38	7.29	
Chicago Bears	1,067	−1.39	2.74	4.14	12.83	11.90
Cincinnati Bengals	905	−5.04	−0.26	4.80	7.90	10.98
Cleveland Browns	1,015	−1.65	1.56	2.62	6.18	
Dallas Cowboys	1,805	9.39	6.36	11.17	9.73	12.90
Denver Broncos	1,049	−2.96	1.81	2.95	8.34	12.43
Detroit Lions	817	−6.31	−2.07	0.93	8.01	10.84
Green Bay Packers	1,018	−0.10	3.17	3.70	11.69	8.94
Houston Texans	1,171	1.83	3.51	4.36		
Indianapolis Colts	1,040	1.46	4.51	7.78	12.10	12.24
Jacksonville Jaguars	725	−16.28	−3.67	0.97	4.65	
Kansas City Chiefs	965	−6.04	0.17	4.84	10.15	11.48
Miami Dolphins	1,011	−0.39	2.38	3.38	7.91	8.76
Minnesota Vikings	774	−7.31	−0.34	3.30	9.17	10.35
New England Patriots	1,367	0.44	4.47	5.62	11.41	14.77
New Orleans Saints	955	1.38	3.80	5.87	11.42	11.34
New York Giants	1,182	−0.08	6.66	7.96	11.81	11.48
New York Jets	1,144	−2.22	5.76	9.13	11.53	12.36
Oakland (LA) Raiders	758	−4.89	−2.27	2.32	9.18	9.51
Philadelphia Eagles	1,119	−0.36	2.08	3.29	13.02	11.51
Phoenix/Arizona Cardinals	919	−1.71	1.15	6.43	11.66	11.31
Pittsburgh Steelers	996	−2.35	2.35	3.97	9.18	12.17
San Diego Chargers	907	−1.09	3.17	5.99	8.72	11.56
San Francisco 49ers	925	5.71	5.00	5.76	9.33	10.05
Seattle Seahawks	989	−0.50	2.40	3.74	9.28	11.28
St. Louis (LA) Rams	779	−14.68	−4.98	0.57	6.42	9.66
Tampa Bay Buccaneers	1,032	−4.88	2.33	3.31	6.85	12.29
Tennessee Titans (Oilers)	994	−0.60	2.54	3.45	6.99	11.80
Washington Redskins	1,550	0.00	1.85	4.16	7.66	14.17
Averages	1,022.4	−2.42	1.97	4.39	9.26	11.38

1998 compared to 1997. However, the data switches from *Financial World* to *Forbes* in 1998, so that may account for part of the difference as well. Later, the down economy decreased growth rates in 2009 and 2010.

Table 3.4 compares the *Financial World/Forbes* data with actual sale prices. While the values can be incorrect by as much as 61% (Stan Kroenke paid $20 million for 10% of the Rams when it was valued at $322 million), the valuation estimates generally are fairly accurate. On average, the estimates were 3.3% less than the actual sale value.

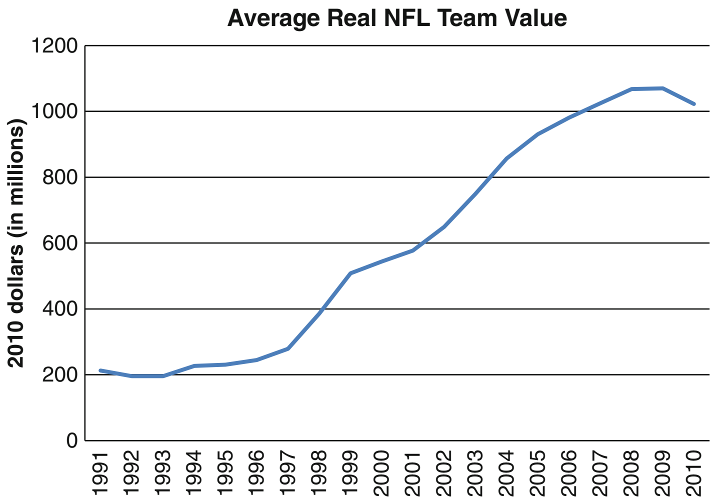

Fig. 3.1 Average real NFL team value

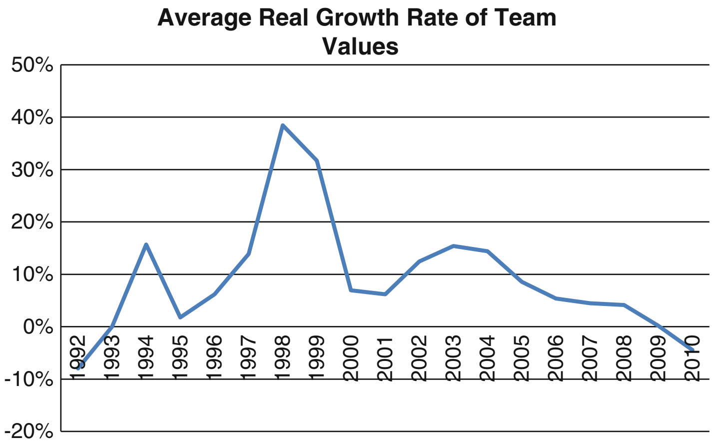

Fig. 3.2 Average real growth rate of team values

3.2.3 Multiple Earnings

Another valuation technique in sports is the multiple-of-earnings approach. This method simply multiplies revenue by some number to find the value of the firm. In 2001, when Bud Selig testified before the U.S. Congress, he provided franchise

Table 3.4 Comparison of Financial World/Forbes data and actual sale prices

Year	Team	Sale value	Financial World/Forbes		Percentage difference (%)
1991	New York Giants	150	150		0.0
1991	Minnesota Vikings	101.96	119.1		16.8
1993	Carolina Panthers	140	161	In 1995	15.0
1993	Jacksonville Jaguars	140	145	In 1996	3.6
1994	Miami Dolphins	128.24	161		25.5
1994	Philadelphia Eagles	185	172		−7.0
1994	New England Patriots	158	142		−10.1
1995	Tampa Bay Buccaneers	192	151		−21.4
1995	St. Louis Rams	200	186	Went to St. Louis in 1995	−7.0
1997	Baltimore Ravens	355.56	235		−33.9
1997	Seattle Seahawks	200	171		−14.5
1998	Minnesota Vikings	214.58	232		8.1
1998	Cleveland Browns	476	557	In 2000	17.0
1998	St. Louis Rams	200	322		61.0
1999	Baltimore Ravens	561.22	408		−27.3
1999	Washington Redskins	800	607		−24.1
1999	Houston Texans	700	791	In 2003	13.0
2000	New York Jets	635	384		−39.5
2001	Atlanta Falcons	545	338		−38.0
2002	Atlanta Falcons	540	407		−24.6
2003	Washington Redskins	1,000	952		−4.8
2004	Baltimore Ravens	637.25	776		21.8
2005	Minnesota Vikings	600	658		9.7
2008	Miami Dolphins	1,100	1,044		−5.1
2009	Pittsburgh Steelers				
2009	Miami Dolphins	1,222.22	1,015		−17.0
	Average				−3.3
	Correlation				0.947

values for Major League Baseball. Most baseball were estimated to be quite close to twice the revenue. Also, *Forbes* (Badenhausen et al. 2009) reports that the 2009 economy had decreased "the average revenue multiple used to value teams from 4.7 to 4.4." It seems to be ubiquitous that sports franchise values are seen as a multiple of their revenues. The benefits of this approach are that it is quick and easy. Only revenue data is needed. The drawback is that costs and growth rates are not taken into account. Clearly cost, growth rates, and depreciation rates are important, but essentially this method is assuming that costs (as a percentage of revenue) and growth rates are similar for all teams. However, given that owners use their team very differently and in different types of ownership structures, it is difficult to see how all teams can have the same ratio between value and revenue.

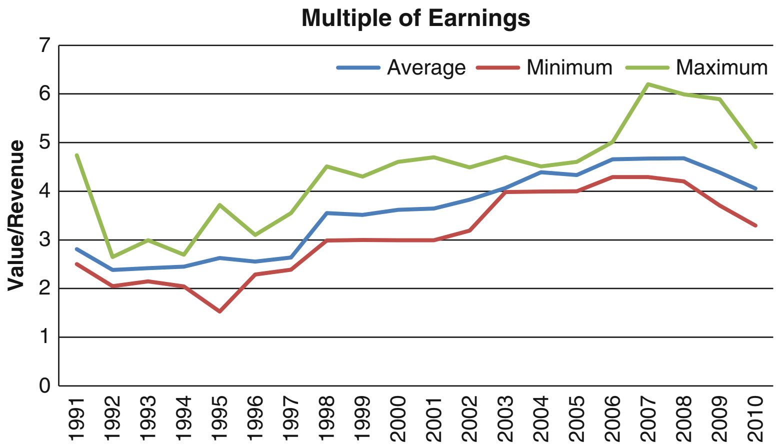

Fig. 3.3 Multiple of earnings

Using the *Financial World/Forbes* data, Fig. 3.3 shows the ratios between franchise values and revenues. The graph shows the minimum, maximum, and average ratio of value to earnings for NFL teams. As the graph shows, this ratio has increased over the 20 years, but in recent years it has decreased to 4.1. Assuming these data are accurate, a basic valuation model would tell us that either costs (relative to revenues) are decreasing, depreciation rates are decreasing, or expected growth rates are increasing over the past 20 years.

If we have some idea of what a typical multiple earnings value is for the league, it might be used to find future values of teams. If an investor is attempting to find a rough estimate of the value of team in 2010 and only knows the revenue of the team, it might be useful to know that on average teams were worth 4.1 times their revenue. However, given what this technique omits, most serious financial analysts would shudder at using a multiple earnings approach to valuing teams.

3.2.4 Constant Growth Pricing Model

The final valuation discussed in this chapter is a constant growth present value model. Finding the net present value of future profits should give an investor the value of that asset. A basic constant growth model is as follows,

$$V = \frac{\pi}{k - g}$$

where V is the value of the team, π is the team's profit, k is the required return, and g is the growth rate of the team's profit. However, while team values, revenues,

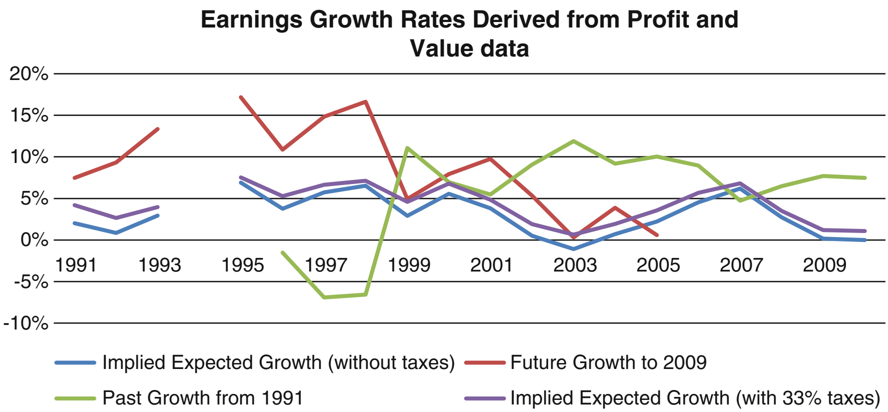

Fig. 3.4 Earnings growth rates derived from profit and value data

and costs are available for the last 20 years,[2] there are still problems with using a constant growth pricing model. First, growth rates are not constant. But since growth rates are estimated anyway, this simplifying assumption is probably not too detrimental. Second, while revenues and costs are available they are not necessarily perfectly accurate, especially when those teams are part of a bigger entertainment complex. Third, interest rates must be used as a proxy for required return, which does not take into account risk among other things. Finally, the net present value of a team also does not take into account any consumption value the owner may have or any assets or debt that are not a part of yearly profits. Regardless, this section makes an attempt to find the implicit growth rates for the profits of NFL teams from the value, revenue, and cost data.

Using the *Financial World/Forbes* data for team values and operating revenues, and using the annual prime rate as the required return, it is easy to then calculate an implicit expected growth rate. However, since the prime rate assumes very little risk, it is probably underestimating the implied expected growth rates of teams. While it is possible to calculate the growth rate for each team for each year, this can create problems since there are some negative operating revenues and some very low operating revenues which create very high estimated growth rates. Therefore, the average operating revenue and value of a team is used for each year. 1994 is omitted because average profits were negative.

Figure 3.4 shows various estimated growth rates over time. First, there are two growth rates that are calculated from the *Financial World/Forbes* data using the constant growth valuation model. The first one is the implied expected growth rates without taxes or other financial obligations. The operating income *Forbes* data

[2] Revenue and cost data is available from 1990 to 2009, which correspond to the franchise values which are available from 1991 to 2010.

reported represents earnings before interest, taxes, depreciation, and amortization. Therefore, the first line assumes profits are equal to operating income. The second implied growth rate assumes that profits are equal to two-thirds of operating income. It is not entirely clear what percent, on average, of operating revenue are profits, especially with the roster depreciation allowance, various ownership structures and various tax laws.[3] However, the graph shows that the implied growth rates are not tremendously sensitive to the ratio of operating income to profits.

Figure 3.4 also shows actual growth rates. It shows past growth rates which are the growth rate of profits from 1991 to the year in question (1992–1994 were excluded due to the short length of the data). Figure 3.4 also shows future growth rates, which are the yearly growth rates of operating revenues from the year in question to 2009 (2005–2008 were excluded due to the short length of the data). The growth of operating revenues over the entire sample is 7.47%. What Fig. 3.4 tells is that the implied growth rates do not correspond with past growth rates (correlation = −0.667), but it does correspond with future growth rates (correlation = 0.800). This means that *Financial World and Forbes* correctly do not use past growth rates as an indicator of future growth rates. This could mean that valuation models are good at predicting the magnitude of future revenues or costs, but given the negative correlation between implied and past growth rates, it may also imply that *Financial World and Forbes* understand that when NFL teams have a bad year, financially they are likely to have a higher profits in the future and vice versa.

What is also interesting about Fig. 3.4 is that the implied growth rates are typically lower than the actual growth rates. This could mean that using the annual prime rate underestimates the actual discount rate. It could also mean that *Financial World* and/or Forbes are actually being conservative with their value estimations.

3.3 Economic Impact

The previous section analyzed the private value of NFL teams, but this section examines the public value of NFL teams. There is a large literature in economics that shows that sports teams typically create little or no financial benefit to a region. One reason is because spending is usually rearranged within a region. Many fans will substitute between the sporting event and some other good. So while a stadium may create some economic activity nearby, when a large metropolitan area is analyzed there seems to be little net economic improvement. Also, increased activity in one area may lead other non-sport consumers to do business elsewhere. Many consumers will avoid an area if it is too crowded. Furthermore, if there is more spending in the region, it often goes to corporations where revenues do not typically stay in the area. Often a corporation's headquarters, and thus profits, are elsewhere. While many forecasts focus on only direct revenue spending from an event (and use a high multiplier effect), typically any net financial gain is small.

[3] In looking at the Packer's Income Statements from 1997 to 2009, net income averages about 75% of profit from operations.

Economic studies show that hosting NFL events are similar to most other sporting events and have little or no economic impact on the local economy. Baade and Matheson (2000) as well as Matheson and Baade (2006) argue that hosting a Super Bowl does very little for local incomes. Many studies argue that building or having an NFL stadium, or stadiums for other sports, has little effect on the local economy or local incomes (Baade and Dye 1990; Noll and Zimbalist 1997; Coates and Humphreys 1999; Rappaport and Wilkerson 2001; Coates and Humphreys 2003; Baade et al. 2008). While some of these studies find a small positive impact, they all seem to agree that the magnitude is far less than subsidies that are often given to teams to build stadiums.

However, the results seem slightly more optimistic regarding economic benefits associated with franchises that are successful on the field. Coates and Humphreys (2002) find that winning a Super Bowl can increase income for the region of the winning team. They do not find the same effect for other playoff teams. Davis and End (2010) extend those findings and argue that as a team's winning percentage increases, so do personal incomes in that area. They further state that this effect may be due to a psychological impact from NFL games. However, Matheson (2006) does not find that income increases if the local team wins the Super Bowl.

Carlino and Coulson (2004) also find that the presence of an NFL team increases land values in that area. They find that an NFL team increases household rents by 8%, which is a very large sum, especially in large cities. In this respect, an NFL team can be viewed as any other amenity that might affect rents. While, Coates et al. (2006) argue that these results are not robust to different specifications, Carlino and Coulson (2006) are adamant that the effect of NFL teams on rents is robust.

Perhaps the greatest "benefit" from NFL teams is the consumer surplus they bring, although again the results are somewhat mixed. Alexander et al. (2000) argue that consumer surplus from attendance is smaller than public stadium subsidies. Johnson et al. (2007) estimated the willingness to pay for a new stadium for the Jacksonville Jaguars at $36.5 million, again far below the typical public subsidy. But while consumer surplus from attending the games might be relatively small, the consumer surplus from the presence of the team might be fairly large. This would imply that the value of watching one's favorite team on television, or having a local team to root for, is relatively high. Fenn and Crooker (2009) use contingent valuation to estimate that the people of Minnesota value the Vikings at about $700 million, or $530 per household. Again, their estimate is not just from attendance, but from the presence of an NFL team. Rosentraub et al. (2009) estimate that the "annual value of the intangible benefits associated with the Indianapolis Colts is $83.9 million," which far exceeds any annual public subsidy. While large consumer surplus values do not necessarily imply subsidies should be made, annual values of this magnitude make the argument for public subsidies for new stadiums easier. The studies seem to show that the consumer surplus with regards to attendance are much less than average public subsidies, but total consumer surplus of all fans are roughly the equivalent to that of a new stadium.

Whether the economic impact and consumer surplus is large or not, the reality is that politicians are scared of losing the NFL teams. Furthermore, the NFL knows this. Just as any monopoly, the NFL restricts output. While it is not at all clear that they limit the number of games in a season, it is clear that their monopoly status helps them with media contracts and the location of teams. Certainly Los Angeles would have a top tier professional football team if the market for professional football teams was competitive. So, to some extent, the NFL limits the number of teams. Small market teams may be more likely to obtain public subsidies since their threat to leave is more credible (Owen 2003).

The NFL's monopoly power and their restriction of the number of teams help them immensely when bargaining with cities. For example, numerous NFL teams have threatened to move to Los Angeles, which in turn has helped them receive public money for a new stadium. So while the economics literature shows that the economic impact of NFL teams is small, public funding of stadiums is still common. This can be explained by a combination of the restriction of the number of teams and fan's consumer surplus. In other words, when a team leaves, fans do not easily forget. It is not the economic impact that fans of the Baltimore Colts, Houston Oilers, Los Angeles Raiders, Los Angeles Rams, and the St. Louis Cardinals miss, it is the enjoyment they had.

3.4 Stadium Finance

Given the restriction in the number of teams, and available markets such as Los Angeles, quite a few teams have received some sort of public funding over the past 2 decades. Table 3.5 gives a short description of the stadium financing for most of these stadiums. The table shows that the public often pays for most of a new facility, but the public pays for this in many different ways. Various taxes and bonds are issued through the city, county, or state government. This section gives more detail of the financing of each of those new facilities.

In 1992, when the Falcons built the Georgia Dome in Atlanta, the state legislature authorized donation of the land for the stadium which was valued at $14 million. The remaining $200 million was raised with industrial revenue bonds. The construction debt was covered by money generated by the stadium and from 39% of a 7% hotel and motel tax imposed in Fulton County. The Georgia Dome is also used for other events throughout the year. St. Louis built the Edward Jones Dome in 1995 and debt was issued by City, State, and County governments to help pay for it. An annual debt service was paid by the City ($6 million from tax revenue), State ($12 million from tax revenue), and County ($6 million from a hotel/motel tax). In 1998, the Baltimore Ravens funded M&T Bank Stadium with bonds issued by Maryland Stadium Authority, cash reserves of the Authority, sports lottery proceeds, and a cash contribution from team owners.

The Tampa Bay Buccaneers built Raymond James Stadium in 1998 and were publicly financed through a 0.5% sales tax. While Raymond James Financial paid $55 million over 18 years for the naming rights beginning in 1998, the team did not pay anything for the stadium. In 1999 in Cleveland, they used a county sin tax, a car rental tax (city), an 8% parking tax (city), and a 2% increase in an admission tax

Table 3.5 Financing of various NFL stadiums

Team	Stadium	Year	Nominal total cost (in dollars)	Paid by team (in dollars)	Paid by public (in dollars)	Taxes/financing
Atlanta Falcons	Georgia Dome	1992	214	0	214	Land donation (state), bonds, hotel/motel tax (county)
St. Louis Rams	Edward Jones	1995	280	0	280	Bonds (tax revenue (city/state), hotel/motel tax (county))
Baltimore Ravens	M&T Bank	1998	220	29	191	Bonds, cash reserves (MD sports commission), sports lottery (state)
Tampa Bay Buccaneers	Raymond James	1998	190	0	190	Sales tax (county)
Cleveland Browns	Cleveland Browns	1999	308	79	210	Sin tax (county); admission tax (city); car rental tax (city); property tax exempt; parking tax (city)
Tennessee Titans	LP Field	1999	290	0	290	Hotel/motel tax (city), bonds w/sales tax (state), land (state)
Denver Broncos	Invesco Field	2001	364	90	266	Sales tax (six counties)
Pittsburgh Steelers	Heinz Field	2001	244	76.5	168	County sales tax; state funding
Detroit Lions	Ford Field	2002	500	70		Hotel/rental car tax (county bonds)
Houston Texans	Reliant Stadium	2002	402	115	287	Hotel/rental car tax (county)
Seattle Seahawks	Qwest Field	2002	430	100	330	Sports lottery (state); sales taxes (county); parking taxes (city); existing hotel/motel taxes
Philadelphia Eagles	Lincoln Financial	2003	512	310	202	City and state funding
Indianapolis Colts	Lucas Oil	2008	715	100	615	Food and beverage tax (surrounding counties)
Dallas Cowboys	Cowboy stadium	2009	1,150[a]	325	675	Sales (city), hotel (city), car rental tax increases (city)

[a]The NFL gave the Cowboys $150 million

(city) to help pay for Cleveland Browns Stadium. The Browns' property was exempted from taxes. The city contribution was $190 million and the state paid $37 million. $64 million was paid by the Browns. In 1999, the Titans used a Nashville City hotel and motel taxes and surplus funds ($150 million) to help pay for LP Field. Furthermore, the state of Tennessee generated $50 million through bonds paid by a sales tax. There was also $2 million in land donation and $12 million in other public contributions.

In 2001, the Denver Broncos contributed $90 million (although one source claims the team paid $115 million) to help pay for Invesco Field. A 0.1% sales tax financed the remainder. The stadium cost was capped at $364.2 million and the taxpayers share was capped at $266 million. The Pittsburgh Steelers contributed $76.5 million in the construction of Heinz Field in 2001. The State provided $75 million for the stadium, with the rest from the Allegheny Regional Asset District, which administered a 1% county sales tax. In June 2001, Pittsburgh-based H.J. Heinz Co. agreed to pay $57 million over 20 years for exclusive naming rights to the Steelers' and University of Pittsburgh's new 65,000-seat stadium.

The Lions financed Ford Field in 2002 through new tourism excise taxes (2% rental car tax and 1% hotel room tax) which were used to pay off Wayne County revenue bonds providing $80 million toward construction costs. $45 million came from the Downtown Development Authority. There was also a $70 million contribution from the Lions and $50 million came from corporation contributions. In 2002, the Houston Texans built Reliant Stadium. A hotel and rental car taxes were used to help contribute $287 million in public financing. $115 million of team funds were used. In Seattle, Seahawks owner Paul Allen paid $100 million for Qwest Field in 2002. An additional $127 million came from new sports-related lottery games along with another $101 million in sales taxes in King County attributed to events in the stadium. There was also $56 million in admissions and parking taxes and $15 million from existing hotel/motel taxes. Paul Allen agreed to pay for any overruns.

In 2003, the majority of Lincoln Financial Field in Philadelphia was privately financed. City and state governments contributed $202 million while the team paid $310 million. In 2008, to fund Lucas Oil Stadium in Indianapolis local counties issued a food and beverage tax (ten counties surrounding the city). There were also bonds taken out by Indiana Finance Authority funded by a car rental tax, innkeeper's taxes, and admissions taxes. The new Cowboy Stadium opened in 2009. To fund the Cowboys new stadium, the Dallas city sales tax increased by one-half of a percent, the hotel occupancy tax by 2%, and car rental tax by 5%. The City of Arlington provided $325 million in funding, and Jerry Jones covered any cost overruns. Also, the NFL provided the Cowboys with an additional $150 million.

It should also be noted that using personal seat licenses in the NFL to fund stadiums is becoming very common. When building a new stadium, teams sell the rights to buy tickets in that stadium. However, under the collective bargaining agreement, this is only allowed when a team is building a new stadium and this revenue does not have to be shared with the rest of the league. The Carolina Panthers were the first NFL franchise to utilize a personal seat license program in 1993, which raised an estimated $100 million in after tax revenue (Ostfield 1995). Since then, another 14 teams have utilized personal seat licenses (Salaga and Winfree 2010). For the new Cowboys Stadium, owner Jerry Jones charged a personal seat license fee ranging from $16,000 to $150,000 for each of his 15,000 club seats (Sandomir 2009). Clearly the revenue from personal seat licenses can cover much of the cost of a stadium.

When we compare the costs of the new stadiums with franchise values, the cost of the stadium is often more than half of the value. Therefore, from the team's perspective, it is crucial that they receive public spending. For example, the $615 million the Indianapolis Colts received from the public represented 57% of their total 2008 value. But as the economics literature shows, these public subsidies are not gained back by the public, at least not financially.

3.5 Stadium Revenue

While we have a relatively good understanding of the cost of a stadium and where the funding comes from, the actual value of a stadium is hard to determine. This is for the same reasons that the actual value of the team can be difficult to determine. First, data is not always readily available. Second, NFL stadiums are being used for a variety of events other than NFL games. So, these new stadiums increase revenue for NFL games, but they also increase revenue because of concerts, games in other leagues, and other events. However, this section attempts to give some understanding of the various stadium revenues.

Table 3.6 estimates the magnitude of some of the sources of stadium revenue. Table 3.6 shows attendance, average ticket prices, the Fan Cost Index (FCI),[4] attendance multiplied by ticket prices, attendance multiplied by FCI, naming rights, and the Forbes estimate of gate revenue. All of the data is from 2009. Attendance is multiplied by ticket prices and FCI to provide an estimate of revenue generated at NFL regular season games. Unlike media revenue, stadium revenue varies greatly among teams. Estimated ticket revenue for the Oakland Raiders is only $22 million while it is $114 million for the Dallas Cowboys. While neither these crude estimates for 2009 ticket/stadium revenue, nor the Forbes 2009 gate receipts estimates might not be exactly right, the magnitude of the values do seem consistent. Also, the correlation between stadium revenue (FCI times attendance) and the Forbes estimate is 0.902, which shows some level of consistency between the two measures.

There is one team that drastically increased stadium revenue from 2008 to 2009, the Dallas Cowboys. Not coincidentally, the Cowboys were the only team that played in a new stadium in 2009. Therefore, the Cowboys give us an idea of the value of the new stadium. Besides attendance increasing over 40%, ticket prices nearly doubled. From 2008 to 2009, their estimated gate receipts went from about

[4] FCI is from teammarketingreport.com, and includes four tickets and various concession and parking prices.

Table 3.6 Various sources of stadium revenue

Team	Attendance	Average ticket price (in dollars)	FCI (in dollars)	Attendance price[a] ($ millions)	Attendance FCI[a] ($ millions)	Naming rights[a] (in dollars)	Forbes gate receipts (2009) (in dollars)
Arizona Cardinals	505,143	67.1	364.4	33.9	46.0	7.7	48
Atlanta Falcons	545,389	72.5	385.8	39.5	52.6		49
Baltimore Ravens	568,660	86.9	481.7	49.4	68.5	5.0	61
Buffalo Bills	490,898	51.2	304.0	25.2	37.3		45
Carolina Panthers	586,314	63.3	330.7	37.1	48.5	7.0	55
Chicago Bears	498,000	88.3	501.3	44.0	62.4		57
Cincinnati Bengals	512,032	69.9	384.4	35.8	49.2		47
Cleveland Browns	551,110	54.7	336.1	30.1	46.3		47
Dallas Cowboys	718,055	159.7	758.6	114.6	136.2		112
Denver Broncos	600,928	76.8	410.5	46.1	61.7	6.0	60
Detroit Lions	395,162	65.7	380.9	26.0	37.6		37
Green Bay Packers	565,666	63.4	377.0	35.9	53.3		48
Houston Texans	564,864	68.5	383.9	38.7	54.2	9.4	58
Indianapolis Colts	532,398	82.8	452.2	44.1	60.2	6.1	55
Jacksonville Jaguars	397,214	57.3	310.3	22.8	30.8		38
Kansas City Chiefs	540,114	80.7	445.8	43.6	60.2		53
Miami Dolphins	540,342	65.6	366.4	35.5	49.5		62

Minnesota Vikings	510,203	73.2	386.9	37.4	49.4		45
New England Patriots	550,048	117.8	597.3	64.8	82.1	7.7	90
New Orleans Saints	560,840	62.2	353.9	34.9	49.6		48
New York Giants	629,615	88.6	483.0	55.8	76.0		58
New York Jets	616,420	87.0	476.3	53.6	73.4		56
Oakland Raiders	354,276	62.2	359.9	22.0	31.9		34
Philadelphia Eagles	553,152	69.0	387.5	38.2	53.6	7.0	53
Pittsburgh Steelers	507,882	67.5	391.9	34.3	49.8		50
San Diego Chargers	540,345	81.4	436.6	44.0	59.0		53
San Francisco 49ers	557,856	70.6	376.7	39.4	52.5		44
Seattle Seahawks	539,141	61.3	378.5	33.0	51.0	5.0	47
St. Louis Rams	441,901	70.2	404.3	31.0	44.7		40
Tampa Bay Buccaneers	440,940	74.3	399.4	32.7	44.0		57
Tennessee Titans	553,144	61.0	356.8	33.7	49.3		47
Washington Redskins	678,352	79.1	441.4	53.7	74.9	7.6	85

[a]The stadium naming rights comes from Forbes. However, teams with less than $5 million a year are not listed

$47 million to probably about $112 million. Therefore, their yearly NFL regular season stadium revenue increased roughly $65 million. The other 31 teams averaged a slight drop in estimated gate receipts of $360,000.

The Cowboys also illustrate difficulties with finding the value of a stadium, at least for researchers not privy to all financial information. As previously stated, the new stadium in Dallas hosts a wide variety of sporting and other events. Since opening in 2009, Cowboy Stadium has hosted college football games, the National Basketball Association All-Star game, soccer matches, and numerous concerts. Without the new stadium, these non-NFL events would clearly not be possible. Therefore, as a revenue generating mechanism, the value of the Cowboy's stadium is immense. But it is also important to remember that revenue sharing is important regarding stadium revenue. With the inclusion of other events at NFL stadiums, and with stadium funding coming from the Cowboys, local governments and the NFL, this can create a tension as to what revenue should be shared.

Naming rights for stadiums are also an increasing source of revenue associated with the stadium. Currently the Houston Texans receive most money from naming rights with Reliant Stadium. They have a $300 million contract over 32 years. This amounts to over $9 million a year. While a $300 million contract can represent a substantial percentage of the cost of the stadium, the value of naming rights varies greatly throughout the NFL. While some teams have revenue from naming rights that are not included in the table, the contracts of teams with revenue under $5 million per year is not easily available and are thus not in the table.

There are other sources of revenue such as stadium advertising that is not available. Furthermore, the playoffs can be a great source of revenue for successful teams. However, Table 3.6 shows that the Dallas Cowboys is the only team that can generate more revenue with their stadium than what they receive from media contracts. For most teams, stadium revenue is roughly half as much as the revenue they receive from media contracts.

3.6 Conclusion

This chapter analyzes franchise values for NFL teams. According to Financial World and Forbes data, NFL franchise values have increased over 12% a year since 1991. This is impressive especially considering profits have grown 7.7% over this time. There are a few possible explanations for this. First, owners are leveraging their teams more than they were in the past. NFL teams are becoming part of large entertainment complexes. These additional profits would not show up in the available data. Another possible explanation is that expected future growth rates are larger than they once were. Other factors that can increase firm values relative to profits are a decrease in risk or a decrease in the required return. Since interest rates are currently low, this may be a partial explanation.

This study goes on to investigate how a team's stadium is related to this value. While media contracts explain part of the increasing values of NFL teams, new stadiums also play a crucial role. However, the public does not see the same economic benefits as the team, even though they often pay for a large part of the stadium. Because of the market structure of the NFL, they are able to extract public funds for these stadiums. Thus, even though fans may not want their team to leave, it is difficult to see stadium subsidies as a good economic investment.

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Chapter 4
An Overview of NFL Revenues and Costs

Phillip Miller

4.1 Introduction

To an economist, a firm is a collection of resources that produces a good or service that is then sold to consumers. A firm provides value to consumers by producing something cheaper than people could do at home. Sometimes it is as a result of the use of economies of scale on the part of the firm and sometimes it is simply impossible for a person to produce the good, like the music of a symphony orchestra. Firms then sell their products to consumers and use the revenue they acquire to pay the resources, including the firm's owners themselves via profits, and to invest in the future of the firm.

NFL teams are no different. They hire various resources—players, coaches, advance scouts, field maintenance personnel, etc.—to produce goods, such as competition, and to obtain other products such as concessions and souvenirs, all of which are then sold to fans. Like many firms, an NFL team is a multiproduct firm. The primary product of sports teams is the competition between teams which takes the form of an individual game, an entire regular season, and a championship season. Teams sell the rights to view the competition through the selling of tickets and media rights.

But the production of competition necessitates at least one other firm must coexist and there must be some form of cooperation between the firms. Walter Neale (1964) and James Topkis (1949) both touched on this facet of the sports industry and Neale gave it a name: the "peculiar economics" of the production of sports competition.

Whereas the ideal market structure that most firms would like to be in is monopolistic, or a market where it is the only seller, having a true monopoly position in sports would be fatal. Who would the monopoly sports team play against? The most successful sports team, however we want to measure it, needs at least one other firm in its industry. Neale put it succinctly in his paper. Writing from the point of view of the New York Yankees, Neale wrote: "Oh lord, make us good but not that good."

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Given that there must be at least two teams in any given sport, the next question surrounds the cooperation that must occur. Teams must define the rules of the game, how a champion is determined, and set the league schedule. It is impractical to negotiate playing rules before each and every game that is played, and it is not much less impractical to have rules that change between each and every game to favor this team or that. Instead, it is more practical to have a set of rules for a season, adjustments to which are made between seasons. That's what we see today in all types of sports including the most amateur of sports, youth baseball, for example, up to high school, college, and the pros. The need to establish common rules that govern sports is what led to the leagues we see in sports all over the world.

A sports league is a cooperative body that can be thought as something of a club. Membership into the league is by invitation only, and incumbents often charge entry fees to capture some of the value that entrants obtain from membership. Leagues are necessary for team survival because of the need for multiple firms for individual firm survival and because they facilitate the development of rules for games, the setting of the playing schedule, and the determination of the league championship. Leagues are costly to form because to have a viable league, people with differing objectives must come to various agreements that are jointly optimal for all involved.

But once that costly effort to form has been made, it is a small step to take to another type of cooperation which economists and others view with critical scorn: cartelization. Cartelization in sports is a cooperative effort that is not needed for individual firm survival. Instead, cartelization allows the individual firms to capture higher profits for cartel members relative to the case when firms compete with one another for consumers and resources.

Sports leagues cartelize in the output market. They jointly determine who gets membership in the league and where teams can call home. They also cartelize in the market for resources, as with the reserve clause in Major League Baseball (MLB) and with the now-defunct Rozelle Rule in the NFL. Whether the cartel is on the output or input side of a market, the successful cartel improves the profitability of each member.

In the remainder of this chapter, I examine the revenues, costs, and profits of NFL teams from an economic perspective. I will argue that both revenues and costs derive from fans' demand for the final product, however it is consumed. I will also argue that what we perceive as revenue and cost imbalance are two sides of the same coin: the imbalance of the size and passion of a team's fan base. I will also examine some of the ways that NFL teams and the league as a whole have tried to rein in costs and increase revenue.

Finally, Zimbalist (2010) notes that revenues and by extension payrolls, the largest component of team costs, are defined through collective bargaining and spelled out in collective bargaining agreements (CBAs). So, while the theoretical concepts of revenues and costs seem straightforward enough, defined revenues and costs are determined by the process of collective bargaining. Therefore, the contract language that defines revenues and costs can be lengthy and complicated. Moreover, because new revenue sources are developed over time, the definition of revenues and costs may change when new CBAs are negotiated.

Moreover, accounting laws and practices help muddy discussions of revenues and costs. As Paul Beeston, former president of MLB's Toronto Blue Jays once quipped "I can take a $4 million profit and turn it into a $2 million dollar loss and get every accounting firm in the nation to agree with me." So, any discussion of revenues and costs must proceed with caution.

The rest of the chapter is organized as follows. The next section examines revenues in the NFL. The following section examines costs in the NFL. The subsequent section examines profits in the NFL and the last section concludes.

4.2 Demand and Revenues

As noted above, sports teams are not single-product firms. They sell a variety of goods to their fans, some of which are complementary to each other, such as tickets, concessions, and parking. Teams also sell a product—media broadcasts—that provide exposure for the team's games and to the fan experience. In this respect, media broadcasts can enhance the demand for the team's tickets and are thus complements.

But attendance and broadcasts are also substitutes in that fans can follow their team without ever having to buy a ticket. To the extent they are substitutes, too much media exposure can erode the demand for tickets and other products sold at the ballpark. Below I will discuss the primary goods sold by NFL teams, individually and collectively, and the revenues generated by each. I also discuss some of the research on these facets of NFL teams' revenue streams.

4.2.1 Overall Revenues

Financial World (1991–1997) and *Forbes Magazine* (1998 and on) have released revenue and team valuation estimates for the four major sports leagues in the United States each year. These estimates, determined by the results of a voluntarily completed survey sent to the teams in each league, provide a useful peek into the cash flows of teams in those leagues.

Table 4.1 presents some statistics on the revenues earned by teams in the four major sports leagues in the United States (NFL, MLB, the National Basketball Association (NBA), and the National Hockey League (NHL)). All data[1] were gathered from Forbes.com. Data for the NFL and MLB were from the 2009 season. Data for the NBA and the NHL were from the 2008 to 2009 seasons. The revenue figures are not inflation-adjusted.[2]

Considering that the NFL is the most popular sport in the United States, it's not surprising that the average NFL team outperforms the average team in the other three leagues in terms of revenues. The average NFL team earned over $250 million in 2009, over $50 million more than the average MLB team earned and more than

[1] All real values are given with a base year of 2009 unless otherwise noted. The Consumer Price Index for all Urban Consumers was used to adjust/convert all financial values into real values.

[2] Since all real values are in base year 2009 terms, 2009 nominal values can also be considered real values.

Table 4.1 Revenues in four major US sports

League (season)	Total revenue ($ million)	NFL (%)	Average revenue ($ million)	NFL (%)	SD	Coefficients of variation	Median ($ million)	NFL (%)
NFL (2009)	8,016	100.00	250.50	100.00	41.3	0.165	242	100.00
MLB (2009)	5,898	73.60	196.60	78.50	57.3	0.292	184	75.80
NBA (2008–09)	3,786	47.20	126.20	50.40	32.5	0.257	115	47.50
NHL (2008–09)	2,819	35.20	93.97	37.50	23.3	0.248	91	37.60

Source data: Forbes.com

the average NBA and NHL teams combined. The comparisons also hold when we look at the median revenues of teams from each league. Overall, the NFL as a league took in over $8 billion in revenue, more than any of the other three leagues and more than the NBA and NHL combined.

NFL teams also have the least amount of dispersion of revenues as evidenced by comparing the coefficients of variation in the four leagues. The standard deviation of the NFL is 16.5% of the mean while the other three leagues each have a standard deviation of 24.8% of the revenue mean or above. The reason for the differences in dispersion is how the revenues are generated and shared in each of the leagues.

Most of the revenue earned by NFL teams comes from the national television contract. The contract is collectively negotiated by league which means that the revenues are collectively generated, in addition to being evenly shared compared to the other three leagues. While the other three leagues also have national television contracts that lead to collectively generated revenues that are evenly shared, teams in these leagues also individually negotiate local television contracts. The values of these contracts are dependent upon local market conditions which lead to more variation of revenues generated by the teams in the other three leagues.

Table 4.2 presents the 2009 revenues of the individual teams in the NFL. The Dallas Cowboys generated $420 million in revenue, to rank first in 2009. They were followed in the top five by the Washington Redskins ($353 million), the New England Patriots ($318 million), the Houston Texans ($272 million), and the Philadelphia Eagles ($260 million). The St. Louis Rams ($223 million), the Minnesota Vikings ($221 million), the Jacksonville Jaguars ($220 million), the Oakland Raiders ($217 million), and the Detroit Lions ($210 million) bring up the bottom five in terms of revenue.

4.2.2 Ticket Revenue

Table 4.3 shows some statistics on revenues by source for the four major sports in the United States. The data is for the 2008 season in the NFL and MLB and the 2007–2008 season in the NBA and NHL. All values are in nominal dollars. The data

Table 4.2 2009 NFL team revenues

Teams	Revenue ($ million)	Teams	Revenue ($ million)
Dallas Cowboys	420	Seattle Seahawks	241
Washington Redskins	353	New York Jets	238
New England Patriots	318	Arizona Cardinals	236
Houston Texans	272	Kansas City Chiefs	235
Philadelphia Eagles	260	San Diego Chargers	233
Baltimore Ravens	255	Cincinnati Bengals	232
Chicago Bears	254	Atlanta Falcons	231
Denver Broncos	250	Buffalo Bills	228
Indianapolis Colts	248	San Francisco 49ers	226
Carolina Panthers	247	St Louis Rams	223
Miami Dolphins	247	Minnesota Vikings	221
Tampa Bay Buccaneers	246	Jacksonville Jaguars	220
New Orleans Saints	245	Oakland Raiders	217
Pittsburgh Steelers	243	Detroit Lions	210
Green Bay Packers	242		
Cleveland Browns	242	Average	251
Tennessee Titans	242	SD	41.34
New York Giants	241	Median	242

Source data: Forbes.com

Table 4.3 League revenues by source

League (season)		Gate receipts ($ million)	Total (%)	Other revenue[a] ($ million)
NFL (2008)	Average	52.63	22.10	184.09
	SD	11.07	–	19.2
	Median	49.50	21.40	179.50
MLB (2008)	Average	76.00	36.60	117.97
	SD	48.36	–	19.12
	Median	60.50	33.50	118.00
NBA (2007–2008)	Average	40.53	31.40	84.97
	SD	16	–	17.4
	Median	36.50	31.20	79.00
NHL (2007–2008)	Average	39.10	41.50	52.47
	SD	15.81	–	9.77
	Median	37.00	40.00	50.00

[a]Net of revenue sharing for the NFL and the NBA
Source: Forbes.com. obtained from Rod Fort's website www.rodneyfort.com

is from *Forbes Magazine* and was obtained from Rodney Fort's website (www.rodneyfort.com). Gate receipts for the NFL, which are net of revenue sharing, make up 22.1% of total revenues for NFL teams while gate receipts for the other three leagues make up at least 31% of total revenues. The average NHL team gets 41.5% of its revenues from the gate. The difference between the average NFL team and the average team in each of the other three leagues is not surprising because the lion's share of revenues is driven by the national television contract and the equitable revenue-sharing system in the NFL.

4.2.3 Ticket Prices

How do economists explain the setting of ticket prices by sports teams? The simplest model involves a monopoly model with fixed costs in which teams only sell tickets and they only sell tickets of one type. The monopoly model is usually assumed because of its ease of use and also because in most cities, the NFL team has no close competitors in its sport. This gives teams market power—the ability to influence the market price—which results in teams facing downward-sloping demand. Brook and Fenn (2008) use a price-cost margin method to demonstrate that NFL teams have some measure of market power.

Do NFL teams set prices to maximize profits? Other goals seem reasonable. For example, an owner may have a goal of maximizing wins with a break-even or minimum profitability constraint. Others may act philanthropically. However, much of what we observe—cartelization, price discrimination, and so on, is consistent with profit maximization, so the profit-maximization assumption is not only a convenient assumption but a realistic one as well.

Moreover, Brunkhorst and Fenn (2010) examine whether the profit-maximization model is an appropriate model to examine the ticket pricing of NFL teams. They find that the profit-gate receipt maximization assumption is consistent with the way that 80% of NFL team set ticket prices.

The fixed cost model is assumed because allowing an additional fan into a stadium is virtually costless once the stadium has been built. Moreover, the bulk of a team's opportunity costs, player and coach payroll, stadium and field maintenance, and front office payroll, do not depend on attendance. Surely teams have some costs that vary with attendance levels, but they are small as a proportion of overall costs. An implication of the fixed cost model is that the marginal cost of allowing a fan through the gate is zero.

Figure 4.1 below represents this model. The profit-maximizing team chooses a ticket price that maximizes revenue which, because of the fixed cost assumption, also yields maximum profits.

In Fig. 4.1, MR represents the marginal revenue derived from selling additional tickets. According to the model depicted in the graph, revenues and profits are maximized when 60,000 fans buy tickets and pay $80 per ticket. Stadium capacity is a weakly binding constraint in this model because the number of tickets sold equals stadium capacity. This adequate describes ticket sales for most NFL games. NFL teams face a stiff incentive to sell out their games—the television blackout rule. If a game does not sell out by a specified period, then its broadcast is blacked out locally. In addition, many teams have a waiting list for season tickets, suggesting that capacity constraints are very important. For example, as of October, 2010, the Denver Broncos have a waiting period of at least 13 years for fans wishing to buy season tickets.

Fig. 4.1 A simple model of ticket pricing

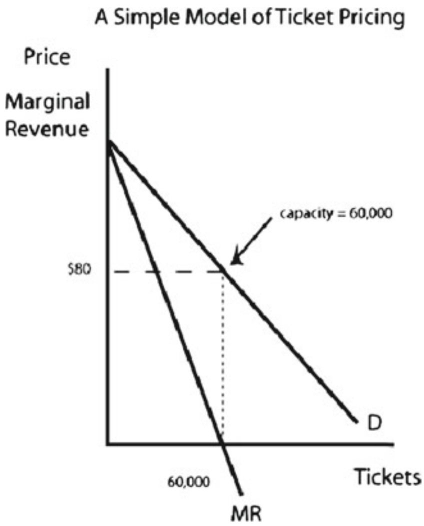

Table 4.4 Comparative average ticket prices[a]

	NFL (2009)	MLB (2009)	NBA (2008–2009)	NHL (2008–2009)
Average	74.99	26.64	49.47	49.67
SD	20.1	12.18	15.09	10
Median	70.03	12.18	47.40	48.67

[a]Raw data are team average ticket prices are weighted averages calculated by Team Marketing. NFL data obtained by the author from http://teammarketing.com.ismmedia.com/ISM3/std-content/repos/Top/News/nfl%20fci%202009.pdf. Other league data obtained by the author from rodney-fort.com. Excludes premium seating. All prices are in nominal dollars

Some of the assumptions of the model are clearly made for simplification. For example, some metropolitan areas, such as New York City, San Francisco-Oakland, and Washington DC-Baltimore, have multiple NFL teams. Also, teams in cities with other major league sports option have to compete against those other sports for fan attention, so duopoly model is a more realistic model for such teams. Teams also have different prices for different sections within the stadium, and the demand for seats in a given section depends on the prices set for seats in other sections. Teams also sell different types of tickets for seats in the same section, like game-day and season tickets. However, relaxing these assumptions would not alter the basic results model: that teams choose their ticket prices to bring in maximum revenue and charge a price above their marginal cost.

Table 4.4 shows average ticket prices for the four major sports leagues in the United States.

The fact that, generally speaking, the NFL is the most-popular sports league in the United States is reflected in the average and median ticket prices. The NFL's average ticket price is approximately 67% higher than the NBA and the NHL, and almost three times as high as the average MLB ticket price. While the NFL, MLB, and the NBA have particularly large outlier ticket prices—as reflected by comparing the median to the higher average ticket price—MLB's average ticket price is most-affected by outlying prices since the average price is over two times as high as the median price. Comparing median prices, the median NFL price is nearly six times as high as the median baseball ticket.

One of the more interesting findings in the sports economics literature is that across a wide variety of sports throughout the world, ticket prices are set in the inelastic portion of the fan demand curve for tickets. The theory depicted in Fig. 4.1 implies that the elasticity of demand at the optimal ticket prices is −1. When observed elasticities are between 0 and −1, demand is inelastic and marginal revenue is less than zero. This tells us that teams are setting prices below the profit-maximizing level.

Fort (2004) has a comprehensive review of this literature and Brook (2006) finds evidence of inelastic ticket pricing in the NFL. If true, this tells us that in a ticket revenue-maximizing sense, ticket prices are set "too low" and more revenue could be generated if ticket prices were set higher. Indeed, Coates and Humphreys (2007) study ticket pricing in the NFL and find that tickets are priced in the inelastic portion of the demand curve and they argue that this is consistent with revenue maximization by monopoly teams that sell related goods inside the stadium.

Porter and Thomas (2010) argue that teams set ticket prices below the revenue-maximizing level in part due to the desire to obtain public subsidies. To enhance the chance that a team gets subsidies, Porter and Thomas argue that teams set ticket prices lower to improve political support.

Miller (2009) offered another reason. He argues that subsidies drive ticket prices lower by giving teams an incentive to invest in more stadium amenities than if they funded their own facilities. In order to encourage more consumption of the extra amenities, teams set lower ticket prices. He finds a negative relationship between subsidies and ticket prices in MLB.

4.2.4 Pricing Strategies and Price Discrimination

Sports teams practice various forms of price discrimination in order to generate maximum profits. Price discrimination is the practice of charging different consumers different prices for the same good and when the cost of provision does not differ between consumers.

Price discrimination in sports takes many forms. Teams give quantity discounts, a form of second-degree price discrimination. They also give youth and senior discounts, forms of third-degree price discrimination. College teams give discounts to their students, another form of third-degree price discrimination. Others will require purchases of tickets to multiple games, an example of the practice of bundling. In college football, Phoenix area residents are required to buy tickets to the 2011 Fiesta and 2010 Insight bowls in order to buy tickets to the 2011 BCS National Championship game.

The selling of personal seat licenses, or "PSLs" as they are usually referred to, is another way for NFL teams to generate extra revenue from season ticket sales. First used in the NFL by the Carolina Panthers to help finance their stadium construction in 1993 (Leeds and Von Allmen 2010), they have become an increasingly popular revenue generator. When a person buys a PSL from a team, he is essentially buying a perpetual right to buy season tickets to sit in a specific seat for the team's home games. Then he has to buy the tickets each season. Because of the dual nature of the transaction, the PSL is an example of the so-called two-part tariff in economics. The first part of the tariff is the PSL itself. The second part of the tariff is the purchase price of the season tickets.

Two-part tariffs are also an important part of the college landscape. For instance, the University of Missouri requires most nonstudent season ticket holders to donate to the Tiger Scholarship fund. The donation works much the same way that PSLs do in the pros. This practice is more or less universal in major college athletics.

The idea behind the two-part tariff is straightforward. The value people place on the goods they buy, including season tickets, generally exceeds the price they pay, and the difference between their valuation and the price is what economists call consumer surplus. Because of this differential, an opportunistic team would see an opportunity to charge consumers a little more to capture some of this consumer surplus as revenue. The problem is that by raising the price of tickets, the NFL team loses some of its unit sales.

But by charging a fixed flat fee, the PSL, the team owner can avoid the reduction in sales once the PSL has been paid. But the PSL will drive some fans out of the marketplace. To sweeten the deal for fans and minimize defections, some teams offer perks to PSL buyers. For instance, in the 2010 regular season, PSL owners to Pittsburgh Steelers games get the right to buy playoff tickets for their seats and they get the chance to participate in a lottery for Super Bowl tickets provided the Steelers are playing in the championship game.

4.2.5 Concessions

But as noted above, access to competition is not the only product sold by sports teams. Teams sell concessions such as peanuts and cracker jacks. To some fans, concessions are a part of the overall fan experience of being at a ballgame. Landsburg (1993), motivated by Oi (1971), suggested that the high concession prices charged at movie theaters might be a form of price discrimination. It is straightforward to extend his analysis to sports teams.

The explanation, assumes two types of fans, one set of fans who have a high value for games and another set of fans who have a low value for games. No one can judge which set any particular fan belongs to, so different ticket prices cannot be charged to fans from the different groups. But if high value fans are also those who have a high demand for concessions at the ballpark, then it makes sense to charge high prices for concessions to extract some of the consumer surplus from the high value fans.

Whether high concession prices are a creative way to price discriminate, Quirk and El Hodiri (1974), Marburger (1997), and Krautmann and Berri (2007) all argue inelastic ticket pricing should be expected in cases where teams sell multiple complementary products.

Teams also sell souvenirs that fans can display in their home or wear in public to show that they visited a particular stadium or to show their allegiance to a team. Teams also sell access to on-site parking, another source of revenue that depends on the number of fans who come to the game and that would help explain why we find evidence of inelastic ticket pricing.

4.2.6 Media Revenues

Media rights are another good sold by teams. When teams sell their media rights, they can do either individually or collectively with other members of the league. NFL teams act independently of one another in selling the local rights to the radio broadcasts of their games, but they act collectively in negotiating their television contracts. In the late 1950s and early 1960s, then-commissioner Pete Rozelle lobbied Congress to give the league the legal right to collectively negotiate television contracts. This lobbying effort paid off in the form of the 1961 Sports Broadcasting Act.

The Act effectively grants the NFL an exemption to US antitrust law in negotiating television contracts. If NFL teams were to negotiate their own individual broadcasting deals, the competition among the teams would tend to yield lower rights fees compared to the cartel case.[3] College football faces no such restrictions and it is now commonplace to see televised games throughout the week during the regular season.

To see the impact cartelization has on rights fees, we can examine what happened when the NCAA was judged to have run afoul of US antitrust laws in its television deals. From 1952 to 1983, the NCAA negotiated television deals for the collection of division 1 (now known as the Football Bowl Subdivision or FBS) teams as a single unit. But in 1984, the US Supreme Court ruled in the *NCAA v. the Board of Regents of the University of Oklahoma* that this arrangement violated antitrust laws. Conferences and individual schools were subsequently free to negotiate their own contracts. The results were consistent with the textbook theory of monopolies.

Economic theory tells us that, compared to a perfectly competitive industry, a monopoly firm restricts output and charges consumers a higher price. From 1978 to 1983, an average of 25 games were shown on television with an average real rights fee of $4.02 million per game (Fort 2011). In the 6 years following the Supreme Court ruling, an average of approximately 41 games were shown on television with an average real rights fee of $1.23 million (Fort 2011). Moreover, from 1991 to 1995, 71 games were televised each year.

[3] It is this Act that also limits the NFL's ability to televise games on Saturdays and Fridays. They cannot televise on Fridays because doing so would interfere with the demand for high school football and televising on Saturdays would interfere with the demand for college football games.

Currently, the Big 10 and Mountain West conferences have their own networks, all Notre Dame home games are shown on NBC, and other schools such as the University of Texas are in negotiations with sports broadcasters to handle their own networks.

In the NFL, nearly every game is televised, the sole exceptions games that are blacked out because of insufficient ticket sales. However, the number of games available on standard over-the-air television or standard cable is severely restricted to the local team's game and perhaps three others broadcast on CBS and FOX, the NBC Sunday Night Game of the Week, ESPN's Monday Night Football. The NFL Network broadcasts a smattering of games and Saturday games are televised once the college regular season and conference championship games are concluded.

Satellite viewers can view out-of-market games by purchasing the NFL Sunday Ticket package on DirecTV for $212 in 2010. Compare that to major college football where almost every Big 10, Big 12, and SEC game is televised along with action from other major colleges throughout the nation.

Theoretically, there is no reason why only two, three, or four teams should collectively sell the rights to their competitive product. But clearly, a monopoly cartel generates maximum profits for the teams.

Teams in the NFL sell most of their radio broadcast rights locally, although there are a handful of games and championship events that are sold as a part of a national broadcast contract.

As noted above, televised contests are subject to the NFL's blackout rule. The broadcasting of sporting events is of particular interest to some economists because of opposing effects they have on attendance. In one sense, broadcasts are a substitute for attendance since they are both ways of viewing the game. However, broadcasts also have an advertising quality about them in that they show the fans, the stadium, the highlights, and so on. Consequently, broadcasts and attendance have a complementary relationship to some extent.

Kaempfer and Pacey (1986) examined a similar sport, college football, and found evidence that the attendance and broadcasts are complements while Fizel and Bennet (1989) find that television and stadium attendance are complements for major college football programs. Overall, however, Fizel and Bennet find evidence that broadcasts and attendance are substitutes. Fort and Quirk (1995) also find evidence that attendance and broadcasts are substitutes.

The NFL's television blackout rules suggest that the NFL fears that television and attendance are more substitute goods than they are complementary. The NFL thus employs them to minimize the ability of fans to substitute broadcasts for attendance.

4.2.7 Revenue Sharing

The NFL revenue-sharing system is a particularly equitable system compared to the three other major sports leagues. Locally generated revenues, including gate, concession, souvenir, and parking revenue, are shared on a 60–40 basis: 60% goes to the home team and 40% goes to a central pool. These locally generated revenues are then put into a pool that is split evenly among the teams.

Table 4.5 Correlation between win percent and revenue

NFL 2009	0.160
MLB 2009	0.532
NBA 2008–2009	0.445
NHL 2008–2009	0.246

The revenues generated from collectively negotiated contracts such as the television contract with the various networks are also shared equally among the teams.

One source of revenue that is not shared is revenue from luxury suites. This sort of revenue was made exempt from sharing in order to give teams an incentive to invest in them. Hamlen (2007) finds that teams from larger and wealthier markets tend to invest more in unshared sorts of revenues.

Looking back at Table 4.1, the NFL's coefficient of variation of total team revenues is less than any of the other major US sports leagues. This suggests that NFL revenues are more concentrated around the average, likely due to the relatively equitable nature of the NFL's revenue-sharing system.

4.2.8 Winning and Revenue

Fans prefer a winning team to a losing team, all else equal. That means teams that have more on-field success can charge higher prices and reap higher revenues.

Table 4.5 presents simple correlation coefficients between team win percents and total team revenue for the four major sports. NFL and MLB data are for the 2009 season and NBA and NHL data are for the 2008–2009 season. As can be seen, the linear relationship between winning and revenue is lowest for the NFL and largest for MLB. Once again, this is likely due to the revenue-sharing system which smoothes out revenue differences between teams in the NFL.

4.2.9 What Makes a Large Market a Large Market?

Fans worried about a lack of competitive balance often point their fingers at large markets vs. small markets. El-Hodiri and Quirk (1971) argue that true competitive balance—when each team in a randomly chosen game has a 50% chance of winning—derives from demand balance. But what is a large market? The factors that determine the quantity demanded for any good are its price, the wealth and income of the average consumer, the number of consumers in the market, consumer tastes and preferences, the availability and price of substitutes and complements, expectations about the future, and other miscellaneous factors. A large market is a market where, relative to other markets, the quantity demanded for a good at every price is high relative to other markets. Or put another way, a large market is one where fans have a higher willingness to pay for a good relative to other markets, and willingness to pay comes from a combination of the factors of demand listed above.

Population is, of course, only one factor influencing the demand for a team, but it is not the only factor. One can think of examples where teams from less-populated areas have larger fan bases relative to teams from larger-populated areas. In college football, for instance, the University of Nebraska Cornhuskers routinely sell out their football games, and have been doing so since the early 1960s.

Located in Lincoln, NE, a city in the southeast corner of Nebraska, has approximately 250,000 residents. Fifty miles to the northeast lies Omaha, Nebraska's largest city, with a metro area population, including part of western Iowa, of about 850,000. No other city in the state of Nebraska comes close to matching either of these cities in terms of population, and the state as a whole only has a population of just under 1.8 million.

The Huskers play in 81,000-seat capacity Memorial Stadium, smack-dab in the middle of Lincoln. So it's not as if Husker fans are routinely jamming their way into a tiny stadium.

Compare that to the University of Minnesota football program. "The U," as it's called in the region, rests in the middle of the Minneapolis-St. Paul metropolitan area, a metro area with nearly 3.5 million residents. Like the University of Nebraska, it is the only FBS school in the state, a state with over 5,000,000 residents. A program with a rich history, the football program rarely sold out games during its tenure in the Metrodome in Minneapolis. So it built a smaller, 50,000-seat capacity, stadium on-campus.

Where the Nebraska football program faces little sports competition, the Minnesota Golden Gophers football team has to compete with the Vikings, Twins, the NHL's Minnesota Wild, and the NBA's Minnesota Timberwolves. Moreover, Nebraska fans love their Huskers. Lincoln becomes a "sea of red" on game day and its fans are regarded as a fan base that travels well. Clearly, if population were the only factor, Minnesota would beat Nebraska on that account. But there is more to demand than population.

4.3 Costs

Like any firm, an NFL team incurs costs to buy resources. Teams buy playing and coaching talent, training staff members, and other resources to produce the product fans see on the field. In this section, I discuss the various costs of NFL teams.

4.3.1 Overall Costs

Table 4.6 shows total operating expenses gathered and published by *Forbes Magazine* for the 2009 season. Operating expenses ranged from \$276.7 million for the Dallas Cowboys to \$182.6 million for the Cincinnati Bengals. The average NFL team had costs of \$217.1 million.

Table 4.6 Team operating expenses 2009

Teams	Operating costs ($ million)*	Teams	Operating costs ($ million)*
Dallas Cowboys	276.7	New Orleans Saints	208.3
Miami Dolphins	254.7	San Diego Chargers	208.3
New England Patriots	251.5	Arizona Cardinals	207.9
Washington Redskins	249.3	Seattle Seahawks	207
New York Giants	238.9	Cleveland Browns	205.9
Houston Texans	235.5	San Francisco 49ers	205
Green Bay Packers	232.2	Indianapolis Colts	204.8
Carolina Panthers	232	Minnesota Vikings	203.1
New York Jets	230.4	Buffalo Bills	199.8
Denver Broncos	228	Atlanta Falcons	196.5
Philadelphia Eagles	225.3	Jacksonville Jaguars	194.1
Pittsburgh Steelers	225.1	St Louis Rams	194
Tennessee Titans	218.7	Tampa Bay Buccaneers	189.9
Chicago Bears	216.7	Kansas City Chiefs	187.2
Oakland Raiders	214.8	Cincinnati Bengals	182.6
Detroit Lions	212.9	Average	217.1
Baltimore Ravens	210.1	SD	21.64416
		Median	211.5

* http://www.forbes.com/lists/2010/30/football-valuations-10_NFL-Team-Valuations_Revenue.html. Accessed Sept 30, 2010

Not surprisingly, team operating expenses tracked team revenues strongly with a correlation of 0.731. The demand for resources is a derived demand: it is derived from the demand for the product or service produced by that resource. All else equal, the greater the demand for the product, the greater the demand for resources that make it. This results in higher revenues and expenses and this is evidenced in the NFL team data.

Table 4.7 presents the average and median real operating expenses from 1990 to 2009. It also presents the standard deviation to give the reader an idea of the spread of values within each year. The average real expense grew from $62.5 million in 1990 to $217.1 million in 2009 with year to year growth rates ranging from −9.3% in 1994 to 24.2% in 1993. Note that average real operating expenses in the NFL from 1990 to 2009 closely track average real revenues (correlation = 0.9849).

The year 1994 was the first year of the NFL salary cap. Salary caps are caps on player payrolls and are designed to keep player salaries, and thus operating expenses, down. The effect can be seen in Table 4.7 as operating expenses fell by over 9% from 1993 to 1994. We will return to the salary cap below.

4.3.2 *Player Payroll*

Table 4.8 presents the payrolls of NFL teams from 2009 (source: *USA Today*). The *USA Today* payroll data is the sum of all players' base salaries as well as bonus payments. The year 2009 is the most recent year of payroll data that was available. Payrolls

Table 4.7 Annual real operating expenses by year

Year	Average ($ million)	Year-ago percentage change	SD	Median ($ million)	Year-ago percentage change
1990	62.50	–	6.04	60.76	–
1991	72.07	15.30	5.07	70.75	16.40
1992	75.38	4.60	8.93	73.78	4.30
1993	93.60	24.20	12.22	95.56	29.50
1994	84.87	–9.30	5.49	85.11	–10.90
1995	85.53	0.80	11.19	84.62	–0.60
1996	98.73	15.40	10.07	97.93	15.70
1997	102.03	3.30	8.8	101.38	3.50
1998	117.59	15.30	10.27	115.69	14.10
1999	129.62	10.20	12.81	129.44	11.90
2000	140.26	8.20	14.61	136.69	5.60
2001	140.76	0.40	13.39	137.91	0.90
2002	145.30	3.20	14.37	145.11	5.20
2003	163.23	12.30	15.13	160.62	10.70
2004	177.15	8.50	24.92	172.35	7.30
2005	177.71	0.30	18.54	175.69	1.90
2006	198.61	11.80	23.62	196.24	11.70
2007	203.76	2.60	21.24	201.11	2.50
2008	203.76	0.00	21.55	200.35	–0.40
2009	217.10	6.50	21.64	211.50	5.60
Average		7.00			7.10

Source: Financial World 1990–1996 and Forbes 1997–2009
Obtained from Rod Fort's website www.rodneyfort.com for 1990–2008 and from Forbes.com. for 2009

Table 4.8 2009 team payrolls

Team	Total payroll ($)	Team	Total payroll
New York Giants	137,638,866	Jacksonville Jaguars	103,558,989
Miami Dolphins	126,855,921	Philadelphia Eagles	102,490,815
Houston Texans	122,573,860	Denver Broncos	102,043,735
New Orleans Saints	121,552,424	Indianapolis Colts	101,203,115
Chicago Bears	120,672,110	Minnesota Vikings	99,806,040
New York Jets	120,168,770	New England Patriots	97,565,413
Pittsburgh Steelers	119,604,460	Detroit Lions	95,963,320
Arizona Cardinals	116,701,866	Atlanta Falcons	95,492,002
San Diego Chargers	115,264,155	Cincinnati Bengals	94,591,308
Green Bay Packers	114,597,569	Cleveland Browns	93,932,182
Carolina Panthers	112,738,038	Dallas Cowboys	90,650,939
Buffalo Bills	111,956,066	Seattle Seahawks	89,075,820
Oakland Raiders	111,527,250	Tampa Bay Buccaneers	84,501,322
Baltimore Ravens	109,200,157	Kansas City Chiefs	83,187,156
Tennessee Titans	109,025,090	St. Louis Rams	62,834,821
San Francisco 49ers	107,746,232	Average	105,617,778
Washington Redskins	105,049,071	SD	15,004,615.60
		Median	106,397,652

Source: *USA Today*

Table 4.9 Average annual real payrolls by year

Year	Average ($)	Change (%)	SD ($)	Median ($)	Change (%)
2000	66,894,420		4,613,546	68,045,976	
2001	85,787,467	28.20	15,105,927	87,675,322	28.80
2002	78,688,184	−8.30	14,499,529	76,827,047	−12.40
2003	89,721,160	14.00	9,851,842	90,383,674	17.60
2004	95,168,128	6.10	13,063,610	92,929,675	2.80
2005	89,744,394	−5.70	10,678,343	89,372,833	−3.80
2006	106,462,693	18.60	13,752,112	106,863,036	19.60
2007	104,367,041	−2.00	9,304,236	104,073,040	−2.60
2008	112,886,632	8.20	16,113,017	112,374,228	8.00
2009	105,617,778	−6.40	15,004,616	106,397,652	−5.30

Source: Calculations by the author. Raw payroll data from *USA Today*

ranged from $137.6 million for the New York Giants to $62.8 million for the St. Louis Rams. The average payroll was $105.6 million and the median was $106.4 million suggesting there are some low payroll values that skew the average downward.

Table 4.9 presents the average real team payrolls from 2000 to 2009 as well as the standard deviation of payrolls and the median payroll. The average payroll has increased from $66.9 million in 2000 to $105.6 million in 2009.

4.3.3 The NFL Salary Cap

The NFL's salary cap began in 1994 as part of a new collective bargaining agreement that also instituted free agency without the Rozelle Rule. The Rozelle rule, named after former commissioner Pete Rozelle, was a rule designed to limit the ability of players to sign contracts with other teams. The rule allowed the commissioner to compensate a team that lost a player to another team with a draft pick from that team. From 1989 to 1992, the Rozelle Rule applied only to 37 of each team's players, those 37 chosen by each team—the so-called Plan B free agency system. The NFL salary cap is not a price ceiling on salaries per-se. Instead, it is a cap on payrolls that each team may have.

The 1935 National Labor Relations Act (NLRA) is one of the primary pieces of legislation in US labor law. The NLRA, also known as the Wagner Act, defines what are called mandatory subjects of bargaining. A mandatory subject of bargaining is a subject that both sides in a labor relations pair must negotiate over if one side wants to. Since player compensation is a mandatory subject of bargaining, anything that affects player compensation, such as salary caps and revenue-sharing systems, must be collectively bargained.

The salary cap is defined in section XXIV of the 2006–2012 CBA as a proportion of total revenues minus league-wide bonuses with the difference divided over the number of teams. Total revenue for salary cap purposes consists of revenues that are earned because of the action on the field (through player effort) including gate revenue, concession and parking revenue, media rights fees, and other miscellaneous cash flows related to on-field performance such as insurance payments that cover lost revenue that, otherwise earned, would be related to the playing of the game.

The CBA also excludes some cash flows as revenue for salary cap purposes. These include proceeds from selling player contracts, revenues from events such as concerts that are not related to football activity and the value of luxury suites used by team owners for personal and business use among others.

In a market economy, prices serve to ration limited resources among unlimited human wants. This is also true in the market for NFL playing talent. Many teams would want to have Tom Brady, Marques Colston, and Troy Polamalu on their teams, but that's not possible. So teams have to bid for their services and the player goes to where he has his highest value—the highest bidder.

Price ceilings and floors put a wrench in the ability of prices to efficiently ration goods and services. But faced with such barriers, buyers and sellers in markets rationally find ways around those barriers. This is also true in the market for NFL playing talent.

The NBA's salary cap is referred to as a soft cap. A soft cap is a cap which contains loopholes that make it relatively costless for teams to exceed the cap. One of the main loopholes in the NBA cap is the so-called Larry Bird rule. The Larry Bird rule is a loophole that allows teams to exceed the salary cap in order to keep star players on the roster. It was named after Boston Celtics star Larry Bird because Boston lobbied heavily for an exemption lest they would have to break up the great Celtics team that included superstar Bird.

The NFL's salary cap is referred to as a hard cap because it contains few loopholes and is, therefore, more costly to exceed. One way to circumvent the cap is through the proration of bonuses regardless of how they are paid. So a 5-year contract with a $10 million bonus paid in equal installments over the lifetime of the contract and one that, all else equal, is paid in one lump sum at the beginning of the contract are treated the same for cap purposes.

Another loophole is that the cap in the NFL only applies to the 51 highest paid players on the 53 man roster. So if a team's 51 highest paid players receive a total payroll equal to the cap, the team may exceed the cap by an amount equal to the sum of the salaries of the two lowest paid players.

A third loophole is a bonus that a player earns for reaching a goal that he has never reached before. Such goals are deemed "not likely to be earned" and their bonuses do not count against the salary cap. So, if a running back has never reached 1,500 yards rushing in his career and earns a $100,000 bonus for doing so, that $100,000 does not count against the cap.

In 2009, as evidenced by Table 4.8, only one team, the New York Giants, exceeded the $128 million cap. However, over half of the teams had payrolls less than the payroll floor.

Leeds and Kowalewski (2001) examine the impact of the salary cap and free agency in the NFL on salaries of players at offensive skill positions. They restrict themselves to analyzing skill positions because of the difficulty of obtaining performance data on some positions (offensive linemen, for example). Also, performance data does not always adequately represent the quality of some players. For instance, an outstanding cornerback may have few passes defended, interceptions, tackles, etc. because opposing teams call their plays to specifically stay away from him.

Leeds and Kowalewski argue that the effect of a salary cap on the distribution of player salaries within a team is ambiguous. Some teams are unaffected by a cap because their spending on players simply lies below the cap level. Those that are affected would employ a different mix of skill talent, some teams employing a larger running-to-passing game mix, and others a smaller one.

They examine quantile regressions of the 25 and 75% percentiles on the salaries of players at four skill positions: quarterbacks, running backs, wide receivers, and tight ends. Comparing 1992 salaries (pre free agency) and 1994 salaries (post free agency), they find that players were paid with respect to the positions they played and their experience in the league in 1992, but their salaries in 1994 were more performance-based. They argue that the adoption of free agency in the NFL drove teams to pay players based upon their productivity.

Leagues have tried other methods to supposedly improve competitive balance, such as revenue sharing and luxury taxes in baseball. Economists have been relatively skeptical regarding the ability of these methods to improve balance, arguing that while they may improve balance, they are mostly in place as cost controls and, therefore, profit enhancers. Solow and Krautmann (2007) examined revenue sharing and the luxury tax in MLB and found that these methods lowered player salaries, all else being equal without improving competitive balance.

4.3.4 Coach Payroll

Unlike player compensation, data on NFL coaching salaries is hard to come by. Fortunately, the well is not dry. Table 4.10 presents 2003 nominal and real salaries for all NFL head coaches. Steve Spurrier, Steve Mariucci, and Mike Holmgren were the highest paid coaches that year, each earning \$5.8 million in real terms. Bill Callahan and Mike Tice were the two lowest paid head coaches in 2003, each earning less than \$1,000,000 in real terms. The average coach earned \$2.93 million and the median head coach earned \$2.92 million.

Table 4.11 presents the top ten highest paid head coaches in 2010 as well as their nominal salaries. According to data gathered by Forbes.com., they were coaches from either the NBA or the NFL. The highest paid NFL coach in 2010 was Bill Belichick of the New England Patriots who earns \$7.5 million. Four of the top ten highest paid coaches were from the NFL: Belichick, Mike Shanahan of the Washington Redskins (\$7 million), Pete Carroll of the Seattle Seahawks (\$7 million), and Jeff Fisher of the Tennessee Titans (\$5.75 million). Van Riper (2010) points out that not even Joe Girardi of the New York Yankees, the team often portrayed as the Goliath of sports, makes the top ten. He argues that this is likely because of the lucrative college jobs that compete with the NFL jobs. Coaching in the college ranks in baseball is not nearly as lucrative as coaching in MLB.

Table 4.10 NFL coaches pay, 2003

Coach	Team	Pay	Real Pay by 2009 ($ million)
Steve Spurrier	Redskins	5.00	5.83
Steve mariucci	Lions	5.00[a]	5.83[a]
Mike Holmgren	Seahawks	5.00[a]	5.83[a]
Mike Shanahan	Broncos	4.75	5.54
Bill Parcells	Cowboys	4.30	5.01
Jon Gruden	Buccaneers	3.75	4.37
Jeff Fisher	Titans	3.40	3.96
Dick Vermeil	Chiefs	3.33	3.88
Mike Sherman	Packers	3.25	3.79
Andy Reid	Eagles	3.00	3.50
Mike Martz	Rams	3.00	3.50
Butch Davis	Browns	3.00	3.50
Bill Cowher	Steelers	3.00	3.50
Tony Dungy	Colts	2.75	3.21
Jim Haslett	Saints	2.75	3.21
Bill Belichick	Patriots	2.625[a]	3.06[a]
Marty Schottenheimer	Chargers	2.50	2.92
Jim Fassel	Giants	2.50	2.92
Brian Billick	Ravens	2.25	2.62
Dave Wannstedt	Dolphins	2.20	2.57
Dom Capters	Texans	2.00	2.33
Dan Reeves	Falcons	2.00	2.33
Dick Jauron	Bears	2.00	2.33
Dennis Erickson	49ers	2.00	2.33
Marvin Lewis	Bengals	1.50	1.75
Gregg Williams	Bills	1.30	1.52
Herman Edwards	Jets	1.20	1.40
John Fox	Panthers	1.00	1.17
Dave McGinnis	Cardinals	1.00	1.17
Bill Callahan	Raiders	0.80	0.93
Mike Tice	Vikings	0.75	0.87
Average		2.51	2.93
SD		1.14	1.33
Median		2.50	2.92

[a]A maximum and minimum was given and an average was taken
Source: Sports Business News cites SportsLine.com. Obtained from RodneyFort.com

Table 4.12 presents average assistant coach salaries, nominal and real, from 2001 to 2005. In 2005, the average offensive coordinator was paid $642,768 in real 2009 terms. The average defensive coordinator was paid nearly 50% more—$955,911 in real terms—compared to the average offensive coordinator in 2005.

Hamlen (2007) notes that coaching salaries are not subject to a salary cap and finds that teams from larger, wealthier markets invest more in coaching talent compared to smaller and less-wealthy markets.

Table 4.11 Top 10 coaches' salaries

Coach	League	Team	Nominal salary ($ million)
Phil Jackson	NBA	Lakers	10.30
Bill Belichick	NFL	Patriots	7.50
Mike Shanahan	NFL	Redskins	7.00
Larry Brown	NBA	Bobcats	7.00
Pete Carroll	NFL	Seahawks	7.00
Mike Dantoni	NBA	Knicks	6.00
Don Nelson	NBA	Warriors	6.00
Greg Popovich	NBA	Spurs	6.00
Jeff Fisher	NFL	Titans	5.75
Doc Rivers	NBA	Celtics	5.50

Source: http://www.forbes.com/2010/05/21/phil-jackson-belichick-mike-shanahan-business-sports-coaches.html. Accessed Dec 17, 2010

Table 4.12 NFL assistant coaches' salaries, 2005

Year	Offensive coordinators	Average salary ($)	Real salary	Defensive coordinators	Average salary ($)	Real salary	All assistant coaches and coordinators	Average salary
2001	27	309	374	30	370	448	493	184
2002	23	330	394	28	417	497	427	198
2003	22	400	466	27	442	515	393	209
2004	21	460	522	19	587	666	334	235
2005	8	585	642	9	870	955	214	280

Salary values in dollars

Johnson (2001) finds that coaching salaries in the NBA and the NFL are positively correlated with winning championships and with coaching experience. He also finds that racial considerations do not matter in NFL salaries but may in NBA salaries.

4.4 Profits

4.4.1 Operating Profits

Finally, we examine the profitability of NFL teams. As mentioned above, accounting rules and principles can be used to mask cash inflows and outflows, thus masking the true profitability of any firm, including NFL teams. So, any examination of accounting profits must be taken with a grain of salt.

Since 1991, *Financial World* (1991–1997) and *Forbes* (1998 and on) have been publishing revenue and cost data from NFL teams. Some of that data has been presented above. Financial World and Forbes have used that data to calculate team

Table 4.13 2009 NFL operating profits

Teams	Operating profit ($ million)	Teams	Operating profit ($ million)
Dallas Cowboys	143.30	Arizona Cardinals	28.10
Washington Redskins	103.70	Jacksonville Jaguars	25.90
New England Patriots	66.50	San Diego Chargers	24.70
Tampa Bay Buccaneers	56.10	Tennessee Titans	23.30
Cincinnati Bengals	49.40	Denver Broncos	22.00
Kansas City Chiefs	47.80	San Francisco 49ers	21.00
Baltimore Ravens	44.90	Pittsburgh Steelers	17.90
Indianapolis Colts	43.20	Minnesota Vikings	17.90
Chicago Bears	37.30	Carolina Panthers	15.00
New Orleans Saints	36.70	Green Bay Packers	9.80
Houston Texans	36.50	New York Jets	7.60
Cleveland Browns	36.10	Oakland Raiders	2.20
Philadelphia Eagles	34.70	New York Giants	2.10
Atlanta Falcons	34.50	Detroit Lions	−2.90
Seattle Seahawks	34.00	Miami Dolphins	−7.70
St Louis Rams	29.00	Average	33.40
Buffalo Bills	28.20	SD	29.49
		Median	28.60

Obtained from http://www.forbes.com/lists/2010/30/football-valuations-10_NFL-Team-Valuations_Revenue.html on Sept 30, 2010

operating profits and to estimate team franchise values. Table 4.13 presents the 2009 team operating profits as calculated by Forbes.

The Dallas Cowboys lead the way with an operating profit of $143 million. The Washington Redskins had a profit of $103.7 million and the remaining 30 teams had profits of $66.5 million or less. Only two teams reported operating losses to Forbes—Detroit at −2.9 million and Miami at −$7.7 million. The average operating profit was $33.4 million and the median profit was almost $5 million lower at $28.6. This is due to the two large outliers, Dallas and Washington.

Table 4.14 presents the real average, standard deviation of, and median operating profit. Average real operating profits ranged from $38.9 million in 2002 to −0.63644 in 1993. The 1993 values are skewed downward by outliers and the median real operating profit for that year was positive at $371,256.

The growth rates of real average and real median operating profits were volatile over the years. Ten of the years saw reported average profits fall and nine saw reported average profits increase. The highest annual growth rate for the average profit was 1994's 805.8% and the lowest was 1993's −110.5%. Interestingly, 1994 was the first year of the salary cap.

For the median operating profits, nine were negative and ten were $0 or greater. The largest median value was $39.58 million in 2004 and the smallest was $370,000 in 1993. The largest growth rate, 660.3%, occurred in 2004, the first year of the salary cap. The smallest, −93.8%, occurred in 1993, the year before the salary cap.

Table 4.14 Real operating profits 1990–2009 ($2009)

Year	Average ($ million)	Year to year growth rate	SD	Median ($ million)	Year to year growth rate
1990	13.95	–	5.01	14.78	–
1991	10.60	–24.00	5.44	9.93	–32.80
1992	6.06	–42.80	7.59	5.96	–39.90
1993	–0.64	–110.50	10.75	0.37	–93.80
1994	4.49	805.80	11.08	2.82	660.30
1995	11.08	146.70	12.03	14.22	403.80
1996	7.56	–31.80	10.14	6.70	–52.90
1997	7.05	–6.80	17.11	3.34	–50.10
1998	25.90	267.50	17.56	21.59	546.00
1999	17.76	–31.40	15.1	14.81	–31.40
2000	18.02	1.50	24.37	16.45	11.00
2001	26.71	48.20	20.69	22.36	35.90
2002	38.99	46.00	22.01	39.24	75.50
2003	30.98	–20.50	18.72	29.21	–25.60
2004	36.83	18.90	14.92	39.58	35.50
2005	33.80	–8.20	23.02	29.56	–25.30
2006	18.91	–44.10	19.21	20.86	–29.40
2007	25.51	34.90	12.73	23.44	12.30
2008	32.19	26.20	20.44	26.66	13.80
2009	33.40	3.80	29.49	28.60	7.30

Source: Financial World 1990–1996 and Forbes 1997–2009, obtained from rodneyfort.com

4.5 Conclusion

These are interesting times in the NFL. Professional football is America's favorite sport and has had nearly two decades of more or less strong labor relations and provided strong returns to team owners.

But labor negotiations, as of this writing, have become somewhat contentious and a lockout may be on the horizon. Some may see this as simple bickering between millionaires and billionaires. While the wealth and high income of the participants are not in question, it is beside the point. Labor relations are always about the division of some pie, regardless of the size of the pie. Both the NFL and the members of the National Football League Players' Association have claims to the pie. Let's hope that both sides can continue to increase the size of the pie and keep the NFL as strong as it has been.

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Part II
The NFL's Major Revenue Streams

Chapter 5
Economics of NFL Attendance

Aju Fenn

5.1 Introduction

The NFL started as an in-person spectator sport. Football teams played in baseball stadiums and around the MLB schedule. That is no longer the case. In 2010 the average attendance at an NFL game has grown to 516,238 spectators at home games. At least 150 million people watched part of an NFL game during the first 4 weeks of the 2010 season. On average 18.9 million people watched an NFL game on TV in 2010.[1] The NFL was the most profitable US professional sports league, with a staggering $7.8 billion in revenues in 2009. While game day ticket sales are still an important part of NFL revenues they are second to the revenues from the NFL television broadcasting contracts. According to Forbes, in 2008 NFL revenues added up to $7.6 billion. $3.7 billion came from television contracts including DirecTV. Thus, the average team made $237 million in total revenue. A typical team made $59 million from ticketing and concessions. Therefore ticketing and concessions were about 25% of revenues, whereas television revenues comprised about 50% of the total revenues. Does attendance at games still matter? Yes it most definitely does. The NFL will not allow games that are not sold out to be televised locally. No one wants to watch a game at a partially filled stadium even if they are at home. It is for this reason that a chapter on NFL attendance deserves our attention.

[1] http://www.nfl.com/news/story/09000d5d81b1cd6d/article/television-ratings-for-nfl-games-up-through-first-four-weeks.

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This chapter will open with an overview of NFL team and league attendance over time. A survey of the evolution of theoretical and empirical issues associated with NFL attendance demand estimation will be provided. Game attendance in the context of other revenues (e.g., concessions, luxury seating, etc.) will be discussed in terms of their complementarities (e.g., two-part tariff models) and substitutabilities (e.g., media).

5.2 League and Team Attendance Over time

Figure 5.1 presents the league attendance per year, 1970–2010. These data are taken from Paydirt and from the NFL Record and Fact Book. The NFL formally came into existence in 1970. A summary of the leagues existing prior to the formation of the NFL may be found in Fenn (forthcoming). In 1970, the NFL had 9.976 million spectators at home games. That number has since grown to 16.52 million in 2010. The average attendance over this period has been 13.4 million with a high of 17.34 million in 2007 and a low of 6.64 million in 1982.

Table 5.1 presents summary statistics for each NFL team across the years from 1970 to 2010. In 1970 each team played seven home games, but beginning in 1978 an eighth home game was added each season, plus a total of four preseason games. NFL paid attendance that year exceeded 12 million for the first time. In 1982 the 16 game season was reduced to 9 games because of a 57-day players' strike, dropping attendance for that year. In 1987 attendance dipped once more because the season was shortened to 15 days due to a 24-day players' strike.

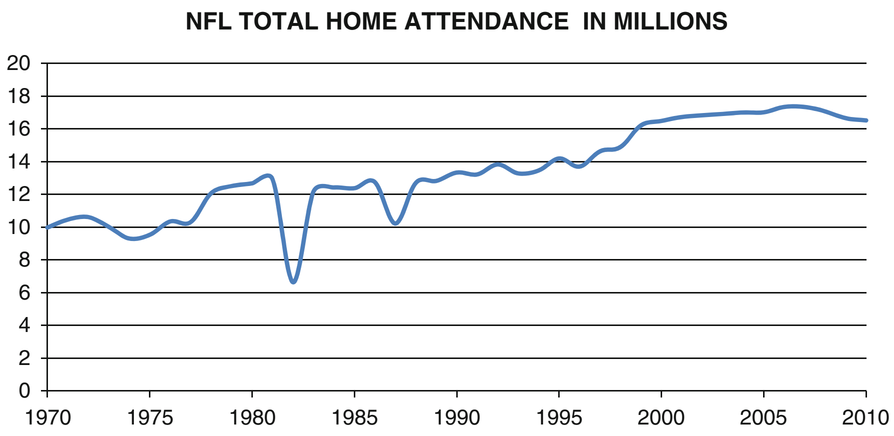

Fig. 5.1 NFL total home attendance

Table 5.1 Total attendance by team, 1970–2010

Team	Total	Average	Maximum	Minimum
Arizona	14,904,729	363,530	504,272	163,901
Atlanta	16,819,057	410,221	553,979	189,815
Baltimore	8,108,296	540,553	557,792	471,665
Buffalo	20,607,946	502,633	635,889	274,441
Carolina	8,870,002	554,375	579,192	441,625
Chicago	18,073,687	440,822	528,465	183,626
Cincinnati	17,109,036	417,294	516,154	216,233
Cleveland	20,348,693	535,492	619,683	247,314
Dallas	19,448,337	474,350	629,749	269,981
Denver	22,255,133	542,808	598,402	340,763
Detroit	19,458,157	474,589	621,353	190,768
Green Bay	18,251,716	445,164	566,418	196,905
Houston	14,382,963	399,527	559,322	200,344
Indianapolis	16,694,144	407,174	532,899	107,646
Jacksonville	8,047,679	502,980	561,472	367,063
Kansas City	20,314,968	495,487	629,569	123,042
Miami	20,579,796	501,946	592,161	238,951
Minnesota	17,647,822	430,435	510,741	285,824
New England	18,050,625	440,259	578,661	149,051
New Orleans	18,939,811	461,947	550,578	255,726
NY Giants	22,580,279	550,739	629,874	319,803
NY Jets	19,985,707	487,456	628,773	182,349
Oakland	16,498,197	402,395	516,205	185,138
Philadelphia	20,132,206	491,029	557,325	297,595
Pittsburgh	17,568,431	428,498	517,599	209,890
San Diego	17,232,083	420,295	549,096	200,249
San Francisco	18,593,913	453,510	544,228	274,837
Seattle	16,481,321	470,895	533,657	260,888
St. Louis	18,772,227	457,859	520,926	258,421
Tampa Bay	15,360,938	438,884	545,980	295,981
Tennessee	7,180,822	478,721	537,496	224,221
Washington	20,182,493	492,256	711,471	205,530

The Denver Broncos lead the league in the total number of fans who have attended games from 1970 to 2010 with 22.25 million seats sold. Tennessee being the youngest franchise, which has a low cumulative total of 7.1 million seats sold. The Carolina Panthers have the highest average annual attendance for the years that they have been in existence with an average of 554,375 fans per year at their home games. The team with the lowest average attendance is the Arizona Cardinals with 363,530 seats sold. The Washington Redskins sold the most ever seats in 2007 with 711,471 seats sold to home games. The lowest seats sold for a single season belong to the Indianapolis Colts in 1982 with only 107,646 seats sold. The league leader in seats sold for each season across the last decade is the Washington Redskins with the Dallas Cowboys narrowing the gap in the last 2 years.

5.3 Empirical Issues Regarding NFL Attendance

There are several empirical issues associated with the estimation of attendance demand in the NFL. For example, the matter of stadium capacity constraints is well-known in other sports, such as MLB baseball, but the right-tail-censored effects might be more pronounced in the NFL due to its high proportion of sellouts. Welki and Zlatoper (1994), among the first to model the determinants of NFL attendance, deal with this problem by using a Tobit estimator of the proportion of people who actually attend games divided by the number of tickets purchased for the game. This causes the dependent variable to lie between zero and one. They estimated their model over the 1986 and 1987 seasons, with the three "replacement player" games played during the 1987 strike omitted from the analysis. They found that ticket prices, the record of the home team, a division opponent, lack of rain, non-Sunday time slots, and the expected closeness of the contest boost attendance in the expected direction, while income of the fan base and game day temperature do not.

Another issue is that of simultaneity of ticket price and attendance. Brook (2006) addressed this matter through the use of a two stage least squares estimated over a panel data set for the 30 (for 1995–1998 seasons) or 31 teams (for the 1999 season). The dataset includes variables regarding NFL team income and expenses, NFL team ticket prices, team performance, stadium characteristics, and market characteristics. NFL spectator attendance is regressed against ticket price, previous and current team win percentage, per capita income, and population of the SMSA, the number of professional sports team substitutes that exist in the local geographic market, a dummy variable for a privately owned stadium, the average of the away teams winning percent and a dummy variable for NFL teams at or above stadium capacity. Ticket prices are found to have a negative and significant effect on attendance, while income is positive and significant. The win percentage and lagged win percentage of the home team are both positive and statistically significant. However, he finds that the average win percentage of the opposing team is not significant. The number of professional sports team substitutes is negative and statistically significant. Controlling for teams at capacity (DCAP) was found to be positive and significantly related to attendance. Finally, privately owned stadiums have a positive impact on NFL attendance. This lends support to Fort's (2004) public choice model. Brook finds a price elasticity at means of −0.47, which suggests that NFL teams price below what they should if they were maximizing gate receipts alone (see discussion below).

Most sports economists assume that sports teams are maximizing profits in a static one-period model. A dynamic model may easily explain why teams underprice tickets in the short run. Owners and front office executives know that an empty stadium is bad for television ratings. A full stadium generates a buzz, especially if the team is winning. Once the fan base is established and there is a waitlist for season tickets, then ticket prices will start to creep up.

Other authors have explored NFL attendance as a rationally addictive behavior. Spenner et al. (2010) estimate current attendance as a function of past attendance, expected future attendance, ticket price, income, and team performance while accounting for sellouts. They first use an instrumental variables approach to generate fitted values for past and future attendance and then use Tobit model in the second stage to deal with sellouts. Their findings lend support to the notion that past and future attendance influence current attendance and that winning is a significant determinant of present attendance.

Issues regarding the stationarity of the attendance series have been studied in MLB. Fort and Lee (2006) contend that with the presence of structural breaks, first differencing is not necessary. A parallel study on the stationarity of NFL attendance has yet to be undertaken.

Finally, Nesbit and King examine the impact of fantasy football on NFL attendance (Nesbit and King 2010). They find support for the hypothesis that fantasy football players are more likely to attend at least one more NFL game per year and that they attend between 0.22 and 0.57 more games per season.

5.4 The NFL Attendance Demand Elasticity Puzzle

Brunkhorst and Fenn (2010) examine whether NFL teams maximize revenues given player costs and a stadium capacity constraint, and find that about 80% of NFL teams act in a manner consistent with static profit maximization. However, the bulk of the sports economics literature suggests that teams set ticket prices lower than profit maximization dictates, possibly so as to capture additional revenues from the larger turn out in associated revenues such as parking and concessions.

The basic puzzle concerning monopoly pricing and elasticity may be explained as follows: Consider a monopolist with a linear demand curve that faces constant marginal costs of zero. In this simple case marginal revenue equals marginal cost at the point that marginal revenue crosses the horizontal axis. At this point the resulting price and quantity combination lies on the midpoint of the demand curve where price elasticity equals unity (El-Hodiri and Quirk 1971, 1974, 1975). Next, consider the same monopolist that faces a positive constant marginal cost. Now marginal revenue and marginal cost will intersect at a point to the left of the midpoint of the demand curve and price should lie in the inelastic portion of the demand curve. The puzzle rests with the fact that most empirical estimates of demand show that prices lie to the right of the midpoint of the demand curve. In other words, although theory predicts that sports franchises with market power should price in the inelastic portion of the demand curve, the empirical reality is that sports teams price in the elastic portion of the demand curve.

Do teams possess market power in the NFL and if so why do they not exploit it fully? Brook and Fenn provide empirical evidence that NFL teams did indeed possess market power over the 1995–1999 seasons (Brook and Fenn 2008). Do NFL teams not fully exploit their market power? It is to this question that we now turn.

Heilmann and Wendling (1976) extend the El-Hodiri and Quirk model for a team facing zero marginal attendance costs. They show that the team owner rationally sets ticket price in the inelastic portion of spectator demand when the non-ticket revenue per fan is positive. On the other hand, when marginal attendance costs are positive and marginal non-ticket revenues are non-existent, the team profit maximizing owner sets ticket price in the elastic portion of spectator demand.

Krautmann and Berri (2007) present a profit-maximizing model where the team produces two goods, tickets and concessions, and the marginal cost of admitting another fan is positive. The posit that if the marginal attendance cost is less than marginal concession revenue, then a profit-maximizing multiproduct monopolist will set ticket price in the inelastic portion of the demand curve. Their empirical results, however, do not lend support to their hypotheses. Boyd and Boyd (1998) suggest that teams price in the inelastic portion of the demand function to promote home field advantage. Lower prices increase the number of home team fans which in turn will increase the home team's probability of winning. Greater competitive success results in more fans at games, which leads to greater revenues. They find that the impact of increased attendance on winning to be very small to be of any real consequence in MLB.

Salant (1992) contends that teams price tickets in the elastic portion of the demand curve because they wish to generate repeat business for the playoffs and for next season. Fort (2004) argues that tickets priced more cheaply than a market power profit maximization model would indicate teams are able to extract higher stadium subsidies due to lower ticket prices (Fort 2004). He presents evidence to back up this claim.

Brook (2006), discussed above, provides an excellent overview of the sports economics literature pertaining to ticket pricing and elasticity puzzles with a specific focus on the NFL, and empirically tests the hypotheses of the papers that seek to explain the sub-par ticket pricing of sports teams. He estimates a demand for concessions as a function of ticket price, attendance, win percentage, per capita income, private/public stadium ownership, the number of luxury suites, and the average win percentage of the visiting team. He finds that ticket prices are not statistically significant in determining concession revenues. This finding refutes Marbruger's (1997) theory that teams price tickets more cheaply in order to attract more fans and make up the money in concessions sales. In order to test their theory, Brook estimates the marginal cost of attendance of NFL games. The empirical findings refute Krautmann and Berri's (2007) theory as well. Finally, Brook tests the theory put forth by Heilmann and Wendling (1976). He finds weak support for their hypothesis.

Brook then proposes his own explanation to the attendance elasticity puzzle. He claims that attendance-driven non-ticket revenues are important to understanding why NFL teams underprice tickets. NFL team non-ticket revenue is modeled as a function of attendance, ticket price, win percentage, income, stadium age, the number of professional sports teams in the local market, and a dummy variable indicating if the stadium is privately owned. Lower ticket prices increase attendance which in turn positively affect non-ticket revenues, since the larger the turn out the greater the increase in the amount of non-ticket revenues. NFL teams rationally set prices in the inelastic portion of spectator demand because it is consistent with overall profit maximization vis-a-vis non-ticket revenue streams.

5.5 Attendance in the Context of Other Revenues

The NFL is adept at capturing consumer surplus by offering a differentiated game day experience. General admission single game seats are usually the cheapest and often do not have the best locations while luxury box seats come with all the bells and whistles of a premier game day experience. Luxury box members often have special parking spots and the fans have their own bar and food stand right in the suite along with their private restroom. The luxury boxes also have televisions so that fans can watch the broadcast of the game. The price of a luxury box seat is substantially higher than a general admission ticket and often boxes must be leased for multiple years. A bowl of popcorn may cost as much a $30 in a luxury box during a Denver Bronco's game. In between the luxury boxes and the average season ticket holders lie the club seats. The club seat ticket holders must pay a personal seat license fee for the right to buy these premium seats. While they are not as expensive or as exclusive as the luxury box seats, club seats often come with benefits such as some shelter from the elements in an outdoor stadium. Club seat members also have access to a much less crowded bar and concession stand than general admission ticket holders. In addition, club seat members may get some opportunities to meet players during golf tournaments and other club sponsored events.

While television broadcasts undermine ticket sales for a team that is not drawing well they also serve to promote the brand of a team that is doing well. Once fans at home see that their local team is winning and that the stadium is sold out, attending a game seems to be a much more appealing idea. Larger television audiences also help the league to get its multibillion dollar television deals with the national networks.

When the dust from the current lockout settles sports economists will immediately analyze the impact of the strike on attendance. Hopefully time series issues and a dynamic model of attendance demand can be investigated next.

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Chapter 6
Media Economics of the NFL

Michael J. Mondello

6.1 Introduction

Despite the presence of other professional sport leagues including the National Basketball Association (NBA), the National Hockey League (NHL), and Major League Baseball (MLB), the National Football League (NFL) is widely considered the most dominant and financially viable sports property. Even the presence of other rival football leagues has not diminished fan enthusiasm for the NFL signifying fans do not perceive there to be any close substitute. Collectively, the three American terrestrial (over the air) television networks CBS ($3.73 billion), NBC ($3.6 billion), and Fox ($4.27 billion), combined with cable television's ESPN ($8.8 billion), are paying a pooled total of $24.4 billion to broadcast NFL games through the 2011 season for CBS, Fox, and NBC and through 2013 for ESPN. Additionally, the current NFL agreement with DirecTV ($4 billion) through the 2014 season tells the story of the NFL's economic engine, its television. Incidentally, this figure excludes the added value created by the games televised by the league-owned NFL Network (Bloom 2010). The NFL's popularity continues to extend into international markets as evidenced by the decision of the network ESPN UK to secure broadcasts rights to televise Monday Night Football live beginning in 2010 despite games starting after 1 a.m. local time (www.sportsprodailydeal.com).

Perhaps, there is no greater indication of the significance of the NFL-media relationship than the Super Bowl. The game is the premier annual television event in the US. For many football fans, the ancillary events associated with the Super Bowl including the social events, promotional activities, and watching the unveiling of new commercials have elevated the status of Super Bowl Sunday to be more connected with non-football-related events than the actual game itself. The costs of a

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Table 6.1 Average television audiences for various programming

Event	Years	Rating	Share	Households	Viewers
Super Bowl	2000–2009	41.7	62.6	45,115,000	90,421,000
World Series	2000–2009	12.1	20.3	13,161,000	19,053,000
NBA Finals	2000–2009	8.4	17	9,957,000	14,320,000
Stanley Cup	2000–2009	2.6	4.9	2,778,000	4,081,000
BCS Championship	2000–2009	16.4	26	17,385,000	26,448,000
Academy Awards	2000–2009	23.9	37.4	25,753,000	39,719,000

Source: Matheson (2009)

30-s Super Bowl commercial increased dramatically from $42,000 in 1967 to $3,000,000 in 2010. Furthermore, the Super Bowl has also become a platform of self-promotion for the network as in favor of selling commercial products such as toothpaste, the networks attempt to sell programming. The overall popularity of the Super Bowl is impressive considering even with expansion, the NFL only occupies 31 markets (Clark et al. 2009).

Of course enormous television ratings also mean significant advertising revenues. A 30-s television spot during the Super Bowl is the single most valuable piece of real estate in all of American broadcast television. Despite the recent economic turmoil, a 30-s commercial during the 2009 Super Bowl sold for $3.0 million representing an 11% increase over the previous year. As shown in Table 6.1, advertising rates at the Super Bowl have experienced a rapid increase over the past 2 decades, far outpacing inflation as well as advertising rates for other major television events.

Of course, the Super Bowl is only the culmination of the NFL season. The league provides hugely popular programming from September through February, and that popularity is on the increase. As noted by Bloom (2010), at the midway mark of the 2010 NFL season, based on statistical comparisons, the NFL continues to generate the ratings that the league's biggest financial partners expected for their multibillion dollar investment. For example, more fans were watching NFL games on television through the season's first 9 weeks than ever before, as noted by The Nielsen Company. Specifically, through the midpoint of the season, more than 175 million fans watched at least part of an NFL game in 2010—topping the 170 million viewers at the same point in 2009. The average NFL game telecast (including broadcast and cable) drew 18.3 million viewers, double the average prime-time viewership (8.6 million) for the big four broadcast networks in the new television season. Also, consider some of these remarkable highlights through the middle of the 2010 season (Bloom 2010):

- NFL games accounted for the 14 most-watched programs on television since the NFL season kicked off on September 9th.
- NFL games averaged 18.3 million viewers—up 7% from the same time in 2009 (17.2 million).
- NFL games accounted for the 30 most-watched programs on television (since September 9th) among adults aged 18–49—with each of the networks televising NFL games represented on that list.
- An NFL game telecast was television's most-watched program in each of the 9 weeks of the NFL season.

- NFL games topped the local ratings in NFL markets 86% of the time—the highest rate in history after 9 weeks.
- 2010s 18.587 million viewers is the highest number of average viewers for the first 9 weeks of the season for the AFC television package in at least 23 years (CBS records go back only until 1987).

6.2 Fundamentals of Sports Broadcast Agreements

While several characteristics define the uniqueness of sports leagues (i.e., cooperation among competitors, economic structures), the most significant revenue source for a professional sports league such as the NFL is undoubtedly the money received in exchange for the opportunity to purchase broadcast rights. For example, a representative of the NFL negotiates a deal where the network agrees to pay the league a contracted upon dollar amount for a specific number of years in exchange for the rights to broadcast league games. After this agreement is brokered, the network then sells commercial time to advertisers during the broadcasts.

Just like sport, definitions of "media" are varied, and elements include jobs, people, and multiple organizations. In contemporary terms, the term "media" typically applies to two separate but related segments. First, it includes means of mass communication such as television, radio, newspapers, or the Internet (Nicholson 2007). Furthermore, among media (television for example), there are many types including commercial, public, independent, and community. "Media" can also refer to individuals who collectively are employed within an organization such as writers and editors.

Today, sport and the media have established a powerful nexus signifying how each entity has strengthened their individual status by associating with the other. Perhaps no other professional sport league has financially capitalized on these relationships as well as the NFL. What factors specifically have impacted this association? While it is beyond the scope of this chapter to detail all of these variables, a brief overview of four key elements identified by Nicholson (2007) follows.

Technological changes have played a significant role in virtually all facets of society, not just in the sport/media relationship. The rapid transition from newspaper to radio, to television, to the internet illustrates how dynamic this relationship can be. For example, sport fans limited to following their favorite team only on a local level a couple of decades ago now have the luxury of accessing information instantaneously on a global scale. The second significant media change focuses on the commercialization of sport. Professional sport franchises have experienced tremendous increases in valuations, which has manifested in NFL team values.

Convergence focuses on how technological changes have impacted the media landscape. For example, consider 5 years ago when a single household received television, phone service, and Internet access via three different sources—now these can be delivered by a single source. Convergence also integrates large media conglomerates such as Disney and News Corporation and their association with professional franchises (Nicholson 2007). Finally, the globalization of sports has reached unprecedented heights. The influx of international player talent in professional sport leagues has created platforms for media to reach broader audiences globally. Furthermore, the cost associated to reach these international audiences is diminutive relative to the potential return.

The overall importance of sport and particularly the NFL has created various scenarios where major broadcasters have engaged in bidding wars over property rights often times resulting in premiums being paid for exclusive rights fees. Furthermore, obtaining the broadcast rights to NFL games has collectively forced competing networks to pay premiums to avoid the adverse financial implications of not having rights to these games (Nicholson 2007).

A unique aspect of televised sports compared to other network programming focuses on the time-sensitive element associated with live sporting contest. Films, weekly series, documentaries, and other television broadcasts can be shown weeks, months, or in some cases even a year after production without jeopardizing viewer interest. Comparatively, yesterday's football game for a majority of fans becomes far less attractive particularly when the outcome is determined and known. As noted by Gaustad (2000), even minor time adjustments with broadcast transmissions can significantly reduce viewership. Economically, the NFL has successfully leveraged the concept of available substitutes as part of their negotiations with broadcast networks. For example, an individual interested in watching political news may choose either CNN, FOX, or CNBC. However, it is considerably more challenging to find suitable alternatives for the NFL or the Super Bowl (Gaustad 2000).

Fundamentally, professional sports have several unique properties independent of other media products, thus increasing their perceived value as valuable national and international commodities. Because live sporting events are considered perishable goods since they endure for brief periods of time, this element alone creates significant fan interest. In addition to being an ephemeral product, NFL football has few suitable substitutes for consumer tastes. Therefore, consumers interested in watching a NFL football game on television have virtually no alternative way to consume the product than to watch the broadcast station with the exclusive rights (Nicholson 2007).

In discussing the scope of the sports–media industry, prominent sport economist Bill Gerrard (2006) identified three specific economic peculiarities: the jointness of production, pro-competitive regulation, and expressive allegiance. Specifically, legitimate sports events require participation from two independent teams perceived as competing to win. Inevitably, this means the property rights to the contest are poorly defined. Consider a regular season NFL game between the Patriots and Steelers played in Pittsburgh. While the Steelers may argue they should retain the property rights exclusively, the game would not occur without the Patriots participation. Furthermore, the game itself has additional economic value since both franchises are part of the NFL.

Professional sport organizations including the NFL have also implemented various policies facilitating competitive balance and attempting to maximize the uncertainty of outcome of their contests. Collectively, regulating policies including salary caps, luxury taxes, reverse order drafts, and revenue sharing have been utilized to create financial stability as well as league viability. Finally, the last oddity associated with professional sports focuses on the sport consumer—the fan and specifically their devoted allegiance to both players and teams. For many sports enthusiasts, their favorite teams are revered similar to their family and friends (Gerrard 2006).

The primary method how over the air television stations recover their monies paid to broadcast sporting events is accomplished by selling advertising space and time (Nicholson 2007). Specifically, advertisers are charged a negotiated rate predicated on expected ratings. The rates are calculated by estimating the potential size of the viewing audience based on previous ratings for comparable telecasts. Fort (2011) identified four mechanisms how leagues sell their programming: (1) National packages to networks distributed to over the air (OTA) networks and cable/satellite providers; (2) local/regional cable packages (although not applicable to the NFL); (3) special premium packages going directly to cable/satellite providers; and (4) Internet subscribers such as NFL.com.

Although two of the most visible television networks, ABC and ESPN, are both subsidiaries of the media conglomerate Disney Corporation, they reported significantly different revenue earnings in 2009 compared to 2008. For example, the over-the-air network ABC declared revenues decreased 3% or $162 million. Comparatively, for cable giant ESPN revenues increased 5% or $514 million. The increases in ESPN's revenues were primarily driven by the increase in affiliate fees derived on a per subscriber basis (Disney 2009).

As noted in their annual report, ESPN's costs increased 6% or $367 million, primarily due to contractual rate increase for noteworthy broadcast agreements, particularly with college and international sports programming (Disney 2009). Specific to their sports programming overall, Disney analyzes these results over time. To illustrate, they report that while in the initial years of a sports broadcast agreement, contractual costs may exceed incremental revenues. However, in subsequent years the company will realize a number of long-term benefits adding value over the life of the contract. The actual realized value will be dependent on a number of exogenous factors including advertising, marketing, and size of the viewer audiences.

This symbiotic relationship was facilitated and moreover legally established as a component of the Sports Broadcasting Act (SBA), which was signed into law by President Kennedy in 1961. The SBA provides leagues with an antitrust exemption which allows teams to pool the broadcast rights to all of their games in order to sell them collectively to the highest bidder (Fortunato 2008). Without the exemption, leagues likely would be prohibited from bundling the television rights of games. Furthermore, the SBA also allows the networks to select for broadcast those games featuring the top teams and players, while minimizing the television appearances of less attractive teams.

6.3 The National Football League's Television History

Undoubtedly, the NFL's current dominant position within the sport's league hierarchy was significantly influenced by the media beginning with NBC's historical broadcast of the NFL championship game between the New York Giants and

Baltimore Colts in 1958. In fact, this game, which featured 17 future Hall of Fame players, was the first and remains the only NFL championship game or Super Bowl utilizing an overtime period to determine the champion (www.profootballhof.com). Following this landmark broadcast, professional football experienced a number of key developments ultimately influencing the current landscape of the league.

Of course, by 1958, the NFL already had been in business for nearly 4 decades. Established in an Ohio automobile showroom in 1920 from the remnants of the defunct American Professional Football Association, the league enjoyed a period of modest growth in its early years, and found itself on sufficiently solid financial ground to survive both the Great Depression and World War II. By 1950, several NFL franchises were contracting selected road games to be broadcast back to their home cities. However, the ensuing league policies adopted for NFL telecasts were initially established from an unusual agreement with the Los Angeles Rams franchise. Specifically, the Rams partnered with television maker Admiral to broadcast all road games back to Los Angeles and their home games live in the local Los Angeles market. The agreement contained a significant stipulation stating Admiral was responsible for making up the financial difference in lost revenue compared with the previous season's home crowds. Although the Rams played in the championship game, home attendance dropped considerably and thus Admiral paid the Rams $307,000 to offset the forgone revenue—a substantial amount 60 years ago (Foster et al. 2006).

The DuMont network televised five games during the 1951 season, and secured the rights for a weekly game 2 years later. Both DuMont and the NFL benefitted from the arrangement. The rights revenues helped nine of the twelve teams in the league to become profitable for the 1953 and 1954 seasons, while DuMont realized its largest advertising income. However, several mediating factors including underdeveloped programming and insufficient advertising dollars ultimately forced the DuMont network out of business a year later in 1955.

In 1956, CBS became the first network to broadcast an entire season of professional football on network television (Cressman and Swenson 2007). After reaching an initial agreement with Commissioner Bert Bell for approximately one million dollars, CBS still needed to negotiate contracts with each team independently (Cressman and Swenson 2007), which it managed to do. The coast-to-coast broadcasts of an entire season was instrumental in moving the league from a regional fan base to more of a national audience, and positioning it as a competitor to the then-more popular college game. The deal also helped CBS compete more formidably with broadcast leader NBC (Cressman and Swenson 2007).

6.4 The Legacy of Commissioner Pete Rozelle

The enormous popularity of the 1958 NFL championship broadcast led to the most significant overall growth phase of the NFL. The increasingly more lucrative subsequent television rights that feed the league to this day were orchestrated under the direction of visionary Commissioner Pete Rozelle, the league's commissioner from

1960 to 1989. In addition to developing the league's broadcast model, Rozelle is also credited with developing many of the NFL's current branding principles. His leadership transformed the NFL into a sophisticated business entity involving various strategic communication elements (Fortunato 2008).

The key element of legendary commissioner's success was his ability to persuade individual team owners and executives to make collective decisions promoting the best interests of the League rather than individual teams. Rozelle got them to understand the potential benefit for the league as a whole through a symbiotic relationship with the television networks. He first convinced large market owners, such as New York Giants owner Wellington Mara, to forego lucrative local television contracts in favor of a deal equally benefiting every franchise. Owners eventually came on board with Rozelle's "league think" ideology, and pooled their individual team television broadcasting rights.

Rozelle's television strategy was made possible with the help of the Congress of the United States after the 1961 deal between CBS and the NFL ran into trouble when it was found to be in violation of US antitrust laws. In September 1961, a bill that would legalize individual television package sales by professional sport leagues was introduced in the House of Representatives, and signed into law by President Kennedy shortly thereafter. This law, the Sports Broadcast Act (SBA), granted sports leagues the antitrust exemption Rozelle wanted, permitting the joint pooling of broadcasts rights to be sold to the highest bidder (Fortunato 2008). Ultimately, these national broadcasting contracts provided the financial security that resulted in economic and competitive parity among its clubs (McCann 2010). With the new SBA in hand, the NFL reached an agreement with CBS for the 1962 and 1963 seasons for $4,650,000. CBS was awarded the deal primarily because the network still had existing contracts with individual teams (Foster et al. 2006).

Rozelle, a respected and experienced negotiator, successfully leveraged the NFL's appeal by taking advantage of the bidding competition between the networks. He understood the importance of developing competitive balance among the teams and how sharing league revenues developed parity. Bidding for the 1964–1965 contract involved a representative from each of the three networks providing a sealed envelope to Rozelle with their 2-year bids for the exclusive broadcast right. The three individual bids were $10.75 million from NBC, $13.2 million from ABC, and $14.1 million from the eventual winner, CBS. The 1964–1965 agreement also included the televising of a second game—or doubleheader providing the local team was not playing at home (Foster et al. 2006). However, by virtue of strong television ratings, the NFL decided to allow television broadcasts of other games even when the local team played at home only 2 years later. This time period also saw CBS experiment with televising a select number of games in prime-time slots. Furthermore, when 80% of the games achieved a 40% share in viewing audience, the groundwork was established for the regular Monday night telecasts introduced shortly thereafter.

In the 1970s, following the AFL–NFL merger, the NFL reached contractual agreements with all three networks. While both CBS and NBC televised Sunday afternoon games, neither network was willing to gamble on broadcasting weekly regular season Monday night games because of the uncertainty of how this would impact their coveted prime-time programming. Collectively, the three network agreements with the NFL from 1970 to 1973 totaled over $185 million and subsequently paid an average of approximately $1.7 million to each franchise (Foster et al. 2006). By the late 1970s, all three networks regarded pro football television rights as absolutely essential in retaining the loyalties of their affiliates (Rader 1984). Moreover, to survive the volatile battles with their competitors, networks understood the importance of sharing NFL television rights. In 1977, Rozelle engineered an impressive $656 million 4-year package providing nearly $6 million annually to each franchise, representing a sixfold increase from the previous 1964 contract. Consequently, television revenue exceeded gate receipts for the first time in league history as a source of team income (Rader 1984).

Capitalizing off an unprecedented 1981 season in which television ratings set an all-time record, the league NFL's broadcast committee successfully leveraged a new 5-year deal worth just under $2.1 billion representing the largest contract in television history and remained until the NFL's next deal of $3.6 billion. However, despite appearing to be an organization with few challengers, the NFL faced several key issues in the early 1980s impacting both their television ratings and public perception. First, a significant Supreme Court ruling against the National Collegiate Athletic Association (NCAA) allowed universities to negotiate with multiple networks to broadcast their football games and also increased the number of times a school could appear on television. Also, the United States Football League (USFL) began play in 1983 and provided football-starved fans the opportunity to now watch games year-round. Finally, the players' strike of 1982 not only cost the league significant revenue, but projected a negative public image characterizing the players as exceedingly greedy.

As the 1980s closed, the NFL utilized entrance into the cable market as a mechanism for maintaining their status as the premier sport entity on television. A new television deal integrated cable giant ESPN and each team realized $17 million annually as part of a 3-year contract. As part of the new agreement, ESPN televised Sunday night games the final 8 weeks of the season. Moreover, a 10.0 rating achieved over the 3-year span made NFL football the highest-rated programming package in cable history (Foster et al. 2006).

The NFL's television appeal continued to flourish at the beginning of the 1990s as the league negotiated a 5-year four network contract highlighted by extending the Sunday night prime-time package to include all of the regular season. Financially, the new deal nearly doubled the previous contract as each team's share of the deal was $32.5 million (Foster et al. 2006). A landmark development occurred in December 1993 when the league announced a new television agreement with existing networks ABC, NBC, ESPN, Turner Sports, and newcomer Fox which replaced CBS.

6.5 The NFL Media Machine Today

Indeed, sports are big business as demonstrated by the 2006 contractual agreement reached between the NFL and their broadcasting partners CBS, FOX, NBC, ESPN, and DirecTV. Collectively, these networks pay the NFL revenue totaling over $3.75

Table 6.2 National television revenues for North American professional team sports leagues

League name	Networks	Annual revenue ($)
NFL	CBS, FOX, ESPN, NBC, NFL	3,700,000,000
NBA	ABC, ESPN, TNT	765,000,000
MLB	FOX, ESPN, TBS	670,000,000
NHL	NBC, VERSUS	72,000,000

Source: Tainsky and McEvoy (2010)

billion per season (Fortunato 2008). This represented a 70% increase from the previous deal which expired in 2005. Broadcasts license fees are one of the main revenue sources for broadcast networks. For example, media mogul ESPN receives a broadcast license monthly fee of $3.26 per subscriber from various cable companies. Comparatively, other major cable networks including USA, CNN, and TBS charge approximately $30 per monthly subscriber (Hutson 2010). Clearly, the relationship of television, the media, and the NFL is significant. Consider in 2009, the *Sports Business Journal* identified the top 50 executives in sports business and among the top 10 individuals, 7 were directly affiliated with the NFL or a television/media organization (Sports Business Journal 2010).

In addition**,** because billions of dollars are annually exchanged between the NFL and its television partners, ensuring the right choice regarding which games to televise, both on national and regional broadcasts, is vitally important. Failing to broadcast games in highest demand inevitably leads to suboptimal viewership and television ratings affecting a number of the most significant stakeholders. Consequently, this hurts both the television networks and their local affiliates as ratings correspond with future advertising prices, leading to lower advertising sales ratings (Tainsky and McEvoy 2010).

In addition to serving as the NFL's largest revenue source, television networks also provide the greatest exposure. In a broadcast rights contract, the network agrees to pay a sports league a negotiated dollar figure for a number of years in exchange for the rights to televise that particular league's games (Fortunato 2008). A major advantage of the various television contracts the NFL has compared to other US sports leagues centers on the fact that the deals are structured around national telecasts with virtually nothing arranged with local broadcasts. Consequently, NFL organizations do not have major financial discrepancies associated with television revenues associated with franchises competing in the NBA, NHL, and MLB. National television revenues for the four professional sport leagues are presented in Table 6.2, and the NFL's current television contract situation is shown in Table 6.3.

A constant challenge facing the NFL television broadcasts is the policy regarding "blackouts." Specifically, in 1973 Congress amended the existing legislation prohibiting the blacking out of home games that were sold out 72 h prior to kickoff. Although this policy (Public Law 93–107) was initially established as a temporary solution and actually expired in 1976, the league has decided to abide by the law in good faith and has been integrated into every television contract to date (Putsis and Sen 2000). Despite the aforementioned popularity of the NFL, blackouts do occasionally occur and have actually risen over the previous seasons. For example, in 2008 the league blacked out nine regular season games (3.5%). In 2009, this total more than doubled

Table 6.3 National Football League television contracts: 2006–2011

Network	Package	Price (annual, $)
CBS	AFC Sunday afternoon	622,500,000
FOX	NFC Sunday afternoon	712,500,000
NBC	Sunday night	650,000,000
ESPN	Monday night	1,100,000,000
NFL Network	Thursday/Saturday nights	0

Note: Because the NFL Network is a subsidiary of the NFL, the network does not pay the league a rights fee. The data above does not include the $700 million/year paid to the league by DirecTV for the rights to sell subscriptions to the Sunday ticket for coverage of Sunday afternoon broadcasts not shown by local network affiliates
Source: Tainsky and McEvoy (2010) unpublished paper

to 22 games or 8.6%, although both the Jacksonville Jaguars (7 games) and Detroit Lions (4) games were largely responsible for increased televised blackouts. Furthermore, the Tampa bay Buccaneers experienced their first blackout of a home game in almost 13 years when they hosted the Kansas City Chiefs in their first pre-season game of the 2010 season. Thus, a streak of 261 consecutive sellouts including pre-season, regular season, and playoffs was broken (Romano 2010).

6.6 Economics of NFL Television Broadcasts

In *The Economics of Sport and the Media,* Solberg (2006) outlined how the overall cost structure associated with sports broadcasting significantly influences the potential profitability. This is illustrated in the following three equations:

$$\text{Total costs} = \text{fixed costs} + \text{variable costs}$$

$$\text{Fixed costs} = \text{production related costs} + \text{sunk costs}$$

$$\begin{aligned}\text{Variable costs} = {} & \text{variable costs of broadcasting} + \text{variable costs of production} \\ & + (\text{oppurtunity costs})\end{aligned}$$

Theoretically, with its high degree of fixed costs and relatively low degree of variable costs, television broadcasts are characterized by having several unique financial advantages. While the initial production and transmission of programming require considerable capital outlay, and therefore have a high fixed costs, the total cost of a television program largely is unaffected by the number of viewers (Gaustad 2000). Therefore, the marginal cost of transmitting a program to one more additional viewer within any broadcasting market is literally zero, and costs essentially remain the same whether the broadcast generates $10 or 10 million in revenues. Profitability is determined by the ability of the broadcaster to spread the fixed costs of production over as many viewers as possible.

Media businesses that can afford the entry costs of broadcast production have opportunities to generate significant revenue when a program can generate numerous viewers. Broadcasters realized early in the histories of both radio and television that sport programming could effectively attract a key audience demographic, often with significant buying power: male viewers in their 20s and 30s. Sports programming quickly became a staple of both media.

Noll (2007) identified and examined three fundamental elements associated with the broadcasting of team sports: the demand for sports rights, the supply of sports rights, and policy implications. He argued consumers are in a favorable position when television rights are competitive and leagues prohibit the practice of centralizing rights sales. Also, centralizing television rights does not improve competitive balance or financially benefit weaker teams. Solberg (2006) acknowledged the dilemma facing networks when there is a decline in the number of viable bidders for sports property rights. In one scenario, scarcity of bidders strengthens the market power of the remaining companies albeit at a cost to governing bodies and also other sports rights owners. Fewer television networks could potentially increase the number of viewers for programs creating an opportunity to make the programs more profitable. Consequently, these interactions will determine the costs associated with sports rights. In fact, as a point of emphasis, media reports determined several networks paying a premium for the right to broadcast NFL games have resulted in substantial financial losses. Perhaps these networks have calculated the opportunity costs of not being associated with broadcasting the NFL to be even greater (Solberg 2006).

Consider the recent contractual settlement between the NFL and cable provider Comcast which was finally resolved in 2009. Initially, Comcast specified it would provide carriage of the NFL network only to those subscribers willing to pay an additional premium above their standard charge while the NFL argued their channel should be made available as part of the basic subscriber package. As part of the settlement, Comcast made the network available on their additional charge tier (Digital package) and the NFL accepted a \$50 subscriber fee—considerably less than their anticipated \$70 fee (Fort 2011). This agreement provides a clear example of how companies can successfully negotiate deals in their favor when a lack of close substitutes exists—in this case NFL quality football. Thus, the NFL can wield monopoly power in terms of professional football given the league's overall status. Furthermore, considering two significant competitors of Comcast, DirecTV and Dish Network were already carrying the NFL network, the cable companies leverage was further weakened.

6.7 Economics of New Distribution Technologies

The formative years of NFL television were dominated by free over the air broadcast television. However, with the growth of cable beginning in the 1980s, satellite television in the 1990s and internet-based and mobile phone distribution in the early twenty-first century, there are now two different formats to deliver NFL programming content to viewers: free TV and pay TV. While much about these two alternatives is similar, there are important differences that have significant economic consequences.

Current NFL fans have the option to purchase a "Sports Package" or more specifically the "NFL Sunday Ticket" offered exclusively by *DirecTV* allowing football enthusiasts the opportunity to watch every out of market game. Creating a negotiating dynamic of more bidders than actual available slots is fundamental to the sports rights holder and was clearly the motive for *DirecTV* in their negotiations with the NFL for the exclusive rights to the "NFL Sunday Ticket." Although the NFL had an option to offer the Sunday ticket games on all cable platforms to all subscribers the same way cable channel ESPN is available, they instead choose exclusivity with DirecTV. By forcing the two cable platform distributors to outbid their competitor, the NFL increased their rights fee 75% with the exclusive deal. Similarly, by owing the exclusive rights, DirecTV forced the passionate NFL fan currently subscribing to cable television to switch to DirecTV to access the Sunday Ticket package. By submitting the winning bid, DirecTV undoubtedly was expecting to capitalize on attracting new subscribers, but more importantly retaining these customers away from both cable and DISH Network (Foster et al. 2006). Economists refer to those goods for which one viewer's consumption does not reduce the availability of the actual good or service for other viewers as nonrival goods.

While both over the air and pay broadcasts are nonrival goods, broadcast distribution cannot practically exclude non-payers, while cable, satellite, and internet networks can. In economic parlance, over the air broadcasts are nonexclusive, but pay transmissions are exclusive. Goods that are both nonrival and nonexclusive are said to be public goods. Those that are nonrival and exclusive are club goods.

A game televised over the air is a public good. One viewer's consumption of a *Sunday Night Football* broadcast on the local over the air NBC station does not reduce the amount of football available for other viewers, but the program is available to anyone with a television at no additional cost to them. Conversely, one person's viewing of *Monday Night Football* does not diminish the quality of another person's viewing, but access to the program, which is carried by the ESPN cable network, can be restricted. Only those cable systems that pay carriage rights to ESPN, and only those subscribers who pay for ESPN are able to watch. Thus *Sunday Night Football* is a public good, but *Monday Night Football* is a club good (Gaustad 2000). The ability to exclude nonpayers from viewing programming provides cable, satellite, and internet-based networks access to a revenue stream not available to traditional broadcasters. While pay TV earns subscriber fees, traditional broadcast TV is nearly completely reliant on a revenue model consisting primarily of the 30-s advertising commercial (Foster et al. 2006). This means that the steady migration of sports programming, including NFL games, from free to pay television is likely to continue.

Mobile broadband technology will change the definition of TV and its increasing availability will change how consumers view content. It will eventually displace television as the No. 1 content delivery mode. For example, in the second quarter of 2009, some 15.3 million US mobile subscribers watched video on their phones, an annual increase of 70%. Also, consider there were 56.9 million mobile Web users in the United States in July 2009, up an astonishing 34% from 2008 and sports applications for mobile devices number more than 2,000 with continued exponential growth expected. Although the variety of mobile platforms make an exact determination difficult, a conservative estimate of mobile downloads of sports applications in 2009 exceeded 25 million (http://www.sportsbusinessjournal.com/article/65447).

In 2010, the NFL announced an exclusive 4-year mobile content distribution deal with Verizon Wireless. In addition to replacing Sprint as the official wireless service provider of the NFL, Verizon will also provide their customers access to live games and access to other restricted information. The deal was estimated to be valued at $720 million according to *The Wall Street Journal* (www.sportsprodailydeal.com). This mobile application will also be popular with fantasy football participants as they will be able to modify rosters, get statistical updates, and follow their respective players.

Among the programming options available for the initial time during the regular season will be the extremely popular NFL RedZone channel from the NFL Network, broadcasting live look-ins of every key play and touchdown from Sunday afternoon games. In addition, interested parties can watch live streaming of NBC's Sunday night football and NFL Network's Thursday night football. Finally, fans will receive the NFL Network channel, which airs 7 days a week, 24 h a day on a year-round basis, and is the only network fully dedicated to the NFL and the sport of football.

Football fans may get a little closer to the dream of watching any NFL game from anywhere in 2010, as DirecTV is expected to soon announce a new package for people desiring to watch games on their computers or smartphone. But there's a big catch: You must live in an area where you cannot access DirecTV's satellites. The streaming program is based on a trial in New York City, where many condominium boards prohibit satellite dishes from dangling from their building subsequently receiving southern exposure (necessary for DirecTV transmission). For those people, a special package was offered to stream NFL games. According to a story in the *USA Today*, DirecTV plans to roll this "hardship" program out nationwide. While it remains unclear what the exact rules will be and the devices offered, the cost has been established to be $350.

Major League Baseball can offer all of its games via the outstanding $15 MLB At-Bat application because parts of their television contracts revolve around local stations. Recently, the Yankees have the most money to spend on player salaries because they generate enormous revenues through their local television deal. Comparatively, the NFL's deals are completely different and not planning to change. Since the major networks—Fox, CBS, NBC, and ESPN—spend billions of dollars annually for the right to broadcast NFL games nationally, the league strictly controls how games are shown. DirecTV's deal is separate, but also highly profitable for the NFL. The current deal runs through the 2014–2015 season and pays the NFL about $700 million annually. It allows DirecTV to offer Sunday Ticket, which costs fans $300 per season, as an exclusive package for DirecTV subscribers. Although cable providers such as Comcast are determined to get involved with this deal, as an alternative the NFL offers the Red Zone channel to placate their subscribers.

Attempting to accurately capture the key developments associated with new media is problematic given the dynamics of how things change. For example, whatever changes introduced within are already outdated when this sentence is written. However, the NFL as well as other viable sports properties has been and will continue to explore potential relationships with digital media outlets. For example, in 2009, the Miami Dolphins (2010) launched a partnership with Kangaroo TV becoming the first NFL team to provide 5,000 hand-held Kangaroo devices for their premium ticket holders (www.sportspromedia.com). These wireless units enhanced the viewing enjoyment for fans as they included multiple camera angles, had select instant replays, camera feeds from other league games, and for the various fantasy sports participant, real-time statistics. Based on overwhelmingly positive consumer feedback, the Dolphins' organization decided to expand their existing partnership. Specifically, the team ordered 20,000 additional devices so the 25,000 units will be provided free of charge to their 50,000 season ticket holders and rebranded as Game Day Vision for the 2010 season (www.sportspromedia.com).

6.8 Capturing the Out-of-Market Fan

In addition to changing the economics of delivery, technological advances also have contributed to sports fans now being fully engaged with their favorite teams. Historically, NFL fans had limited opportunities to watch teams outside their local markets unless that home team was involved in a national broadcast such as *Sunday Night* or *Monday Night* football. To illustrate, for an avid Pittsburgh Steeler fan living in Florida, the opportunity to watch the Steelers on television was limited to national telecasts. However, this dramatically improved in 1994 when DirecTV initially offered the Sunday ticket package allowing fans the chance to watch every one of their teams' games regardless of their location. Today, more than two million of DirecTV's 18 million US customers subscribe to the Sunday Ticket, paying between $200 and 400 each season to watch every NFL game. Furthermore, millions more assemble into sports bars to watch the Sunday ticket each week (King 2009). Along with access to both free and subscribed internet coverage, and the use of other media platforms such as cellular phones, today's fan experience is undeniably superior to those options just a decade ago. A transplanted New York Giant fan that relocated to Tampa, FL can experience virtually the same level of engagement with their team as one who still lives in New York.

Creating a negotiating dynamic of more bidders than actual available slots is fundamental to the sports rights holder and was clearly the motive for DirecTV in their negotiations with the NFL for the exclusive rights to the "NFL Sunday Ticket." Although the NFL had an option to offer the Sunday ticket games on all cable platforms to all subscribers the same way cable channel ESPN is available, they instead choose exclusivity with DirecTV. By forcing the two cable platform distributors to outbid their competitor, the NFL increased their rights fee 75% with the exclusive deal. Similarly, by owing the exclusive rights, DirecTV forced the passionate NFL fan currently subscribing to cable television to switch to DirecTV to access the Sunday Ticket package. By submitting the winning bid, DirecTV undoubtedly was expecting to capitalize on attracting new subscribers, but more importantly retaining these customers away from both cable and DISH Network (Foster et al. 2006).

To further illustrate why sport leagues and more specifically their respective marketing departments should think about creative ways to reach out of market fans, consider a research survey commissioned by the NFL conducted by ESPN Sports Poll reported almost 60% of NFL fans say their favorite team is their local team—indicating 40% say it is not. That projects to about 68 million out-of-market NFL fans. Moreover, the CEO of MLB Advanced Media, Bob Bowman, estimated half of MLB fans in the United States follow teams from outside their local market, a fact driving MLB.com's aggressive expansion of subscription products. Furthermore, about a half-million fans pay to watch out-of-market games online, and another quarter-million purchase games on their iPhone (King 2009).

6.9 Economic Challenges Facing NFL Media Distribution

While technological advancements have proven to provide the NFL with additional revenue streams, they can also serve to compromise them as well. Despite the lucrative financial contracts, professional sports league remain cautiously optimistic with electronic distribution of their product. For example, legitimate concerns associated with how broadcasts may reduce fan attendance in the short run combined with reducing fan interest. Fans may choose to substitute their consumption of the NFL away from more expensive options toward cheaper ones. As in-person attendance becomes increasingly costly and unpleasant (pat-downs and traffic jams) while free HD broadcasts on big screen home theater systems—and now 3D—become more easily available, fans may more frequently opt not to spend hundreds of dollars going to the games.

Tainsky (2010) examined television ratings for NFL games to estimate demand. Historically, while attendance has been used as a proxy for demand in the sports economic literature, Tainsky (2010) argued sports programming and the growth of media warrant further analysis. Subsequently, the author examined how factors influencing attendance might also impact television demand. The use of television broadcasts instead of attendance allows comparisons of demand in both the home and road teams' markets. Collectively, several of the identical team quality, game uncertainty, and market variables influencing attendance in other sports also impacted demand for NFL broadcasts (Tainsky 2010). One notable finding was related to the number of teams sharing the same television market. Specifically, when teams shared a market with another organization, there was an average rating reduction of 7.31 suggesting NFL teams are close substitutes for one another.

Another issue is online piracy. Today, there are multiple outlets where fans can access live games without incurring a cost. As noted by Ourand (2010), despite efforts by the NFL to monitor illegal streams of games, the ease of access in which fans can watch games over the internet is potentially troubling. For example, in 2009 a series of interviews conducted with over 125 students enrolled in classes in the prestigious Wharton Business School reported nearly 60% were able to find games to watch via a simple Google search. Although many of the students indicated there were compromising issues with the viewing including poor quality, buffering problems, and dropped feeds, because there were no costs to watch these games, this created an alternative to purchasing the Sunday ticket from DirecTV (Ourand 2010). Despite these challenges, it is likely that the NFL is going to remain a dominant player in US, and perhaps even global, media.

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Chapter 7
Merchandising NFL Brands and Intellectual Property Rights

Stephen McKelvey and Ryan Spalding

> Score! Verizon Strikes $720 Million Deal with NFL
> Anheuser-Busch NFL Deal Worth $1.2 Billion
> New England's Patriot Place a Model for Green Bay Packers' Lambeau Field Area Development Plans
> Verizon-NFL deal: Convergence is Here
> Nike Tackles NFL's Apparel Contract, Replaces Reebok as Official Uniform Supplier in Deal Worth $175 Million
> Goodell Sets Revenue Goal of $25B by 2027 for NFL

These recent headlines reflect the magnitude of a business enterprise that is generating over $8 billion annually as a result of the merchandising of the NFL brand and the leveraging of its intellectual property rights. Commissioner Roger Goodell's ambitious revenue goals reflect a paradigm shift in the business model of the NFL—from a licensing-centric to a media sales-centric enterprise.

"The major professional sport leagues like the NFL have essentially become media sales companies. It's become the ultimate litmus test on potential success of a sport property brand," stated the owner of a leading sport sponsorship consulting firm (Personal Communication October 25, 2010). Added Terry Lefton, a leading sport marketing journalist: "The NFL is now a media company, tasked largely with creating non-game events that can generate media sales through both digital and off-line channels. An overwhelming number of NFL fans never see a game live, so it's become all about how to get them to touch and feel the product" (Personal Communication October 13, 2010).

This paradigm shift marks the convergence of two distinct forms of intellectual property rights—trademarks and copyright—as the NFL marries its more traditional licensing and sponsorship sales with digital media rights that provide companies access to copyrighted content. The result, according to Commissioner Goodell, is a

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revenue target of $25 billion by 2027, an amount that would entail adding nearly $1 billion in new revenue on average each year until then (Kaplan 2010a). The bulk of this goal will come from the ability of the NFL to leverage its intellectual property rights across a wide range of platforms, including off-line and digital media, sponsorship and licensing on a global scale.

7.1 The Founding of NFL Properties

The beginning of the NFL's merchandise and licensing business can be traced to Pete Rozelle and his tenure as the General Manager of the Los Angeles Rams in the late 1950s. The Rams opened the league's first team store in 1957, which planted the seed for the creation of NFL Enterprises on October 1, 1959 as a division of Roy Rogers Enterprises. Under that arrangement, Rogers took half of all royalties, with NFL teams sharing the rest. The first product marketed by NFL Enterprises was team-logoed glassware (which was sold to Standard Oil Company to give away with gas fill-ups) and within the year, 45 manufacturers were producing over 300 NFL items (Oriard 2007).

NFL Enterprises posted a loss in the first year, but volume increased quickly and it was profitable by 1962. At this point, Rozelle had become commissioner of the NFL (being voted to the position in 1960) and he saw the value of bringing this business in-house. In 1963, he did just that, forming NFL Properties, Inc. (NFLP) as "a business arm of the 14 teams, individually and collectively, in such areas as youth sports competitions, publishing, advertising, and merchandising" (MacCambridge 2004). To ensure that NFLP got off to a good start, Rozelle hired Rogers' general manager Larry Kent as its first president. Although profits were small throughout the 1960s and 1970s, Rozelle saw the business as a significant means to increase the prestige and profile of the league. As such, Rozelle created NFL Charities in 1973 through which the modest profits from NFLP were funneled to bolster public relations.

NFLP didn't become big business until the 1980s, with gross revenues ballooning from just $1.5 million in 1969 to $500 million by 1986 (Oriard 2007). In 1982, the NFL teams created what was called the "NFL Trust" as a joint mechanism to offer nearly exclusive licensing and sponsorship rights (the Miami Dolphins and Oakland Raiders opted not to participate in the Trust and the Dallas Cowboys participated but resisted the exclusivity of the arrangement). By the time Jerry Jones purchased the Cowboys in 1989, the significant profits that were being generated through NFLP and being equally shared began to raise issues particularly among those teams and owners who were responsible for a disproportionate share of the profits. With the on-field success of the Cowboys in the early 1990s, the team was accounting for as much as a third of NLFP sales, which by then were bringing in an estimated $150 million in profit per year. Unwilling to settle for his small equal share, Jones sought ways to maximize his profit at the expense of the league which led to a lawsuit and countersuit between Jones and the NFL. This dispute is described in further detail later in the chapter, but the resolution of this conflict substantially altered the way that NFLP did business, with clubs securing much broader local rights (and the corresponding profit potential) to negotiate individual sponsorship deals at the expense of league-wide sponsorship deals.

Throughout the Jerry Jones situation and even after, NFLP business continued to thrive, with gross revenues exploding to $2.5 billion dollars in 1993 and reaching $3.5 billion by the turn of the millennium (Oriard 2007). During this time, the NFL was evolving from merely running a football league to managing and selling a "brand." From 1994 to 2000, under the innovative brand management savvy of Sara Levinson, a former MTV executive, the NFL embarked on a new marketing campaign designed to sell the sport beyond hard-core fans by appealing to women, youth, and casual fans. As part of these efforts, NFLP increased retail licensing even further, and profits followed, with the league realizing a royalty of between 8 and 12% of wholesale prices of NFL-branded merchandise as profit (Yost 2006). Although NFLP was responsible for various money-making endeavors, including selling corporate sponsorships and producing game-day programs, retail licensing was by far the greatest revenue generator. Yet by the late 1990s, the market for NFL products had become saturated by thousands of items produced by over 350 licensees, significantly depressing profit margins and product quality.

In 2000, with Levinson resigning and Chuck Zona now in charge of licensing, NFLP reevaluated its business model and decided to streamline operations and cut licensing agreements down to around 125 manufacturers. Around the same time, the NFL consolidated its various business operations (including NFLP, broadcasting, and internet) into one unit, called NFL Business Ventures and headed by Roger Goodell, who would go on to become commissioner of the NFL in 2006. One of the first major initiatives of this new unit was to reduce apparel licensing to a single company in order to create uniformity and maintain a high level of quality. As a result, in 2002, Reebok was awarded the *exclusive* apparel license for all 32 teams over 10 years for a rights fee of $250 million (an average of $25 million per year, exclusive of royalties on product sales). This accomplished Zona's goal but also triggered the *American Needle*, *Inc. v. National Football League* (2008) lawsuit (further discussed below) which has the potential to upset the NFL's licensing model.

In adopting a "less is more" approach to licensing, the NFL continued to grow its licensing revenues by making a strategic push into new and previously untapped markets, particularly the female and youth segments. Despite the NFL's complications with Jones and the Dallas Cowboys in the mid-1990s, all of the teams (with the exception of the Cowboys and Miami Dolphins) agreed upon the renewal of the NFL Trust in 2004 for another 15 years, showing their overall continued commitment to the concept of equal revenue sharing. By 2004, the league's licensing and sponsorship business alone was estimated at $3.5 billion annually—which, after taxes and operating expenses, provided each of the teams with about $4 million a year (Yost 2006). Although this amount pales in comparison to profits from television contracts, the importance of this line of business in terms of bolstering the NFL brand and allowing consumers to live that brand cannot be overstated.

7.2 Legal Foundations for NFL Merchandising

The legal system has played a vital role in the development and growth of the merchandising of the NFL brand. Early case law helped to provide the legal foundations upon which the NFL's fledgling licensing program could grow. Subsequent cases settled challenges between the league and individual owners over the breadth and scope of the league's sponsorship rights, and two pending cases (one having reached the Supreme Court level) have the potential to further illuminate the landscape of the NFL's merchandising rights. While by no means exhaustive, the following section highlights some of the more important legal decisions that have impacted the development and subsequent growth of the league's merchandising rights.

7.2.1 Trademark Rights Issues

One of the earliest cases, *NFL Properties*, *Inc. v. Wichita Falls Sportswear Inc.* (1982) involved a retailer who manufactured football-styled jerseys featuring the word "Seattle" and the Seahawk's blue and green team colors. NFL Properties sued for trademark infringement on the premise that the Seahawks' team colors had acquired secondary meaning; hence, Wichita Falls' unlicensed jerseys were likely to cause consumer confusion as to the actual source of the goods. The main issue for the court was whether or not the NFL could claim trademark rights in the descriptive terms designating the team ("Seattle"), when the terms were presented in conjunction with the official team colors, large numerals and sleeve designs. The court held that while color itself was generally not capable of trademark protection, it could be an essential element in an arbitrary arrangement of symbols or words and thus could be protected in that context. Additionally, the court stressed the physical similarities between the NFL's official team jerseys and the unlicensed manufacturer's jerseys, finding a calculated effort on the part of Wichita Falls to create buyer confusion. This early decision was among the legal foundations for the growth of the NFL's licensing product division, for one can only imagine the hurdles to growth had the court held in favor of Wichita Falls.

The trademark protections afforded by the federal Lanham Act—as well as arguably the political clout of the NFL—have served the NFL and its teams well in terms of maintaining the merchandising of the brand. A string of post-*Wichita Falls* trademark cases continued to reinforce the power of the NFL brand and its teams. In 1979, the Cowboys prevailed in a highly publicized lawsuit against a pornographic video production company on the premise that the Dallas Cowboy cheerleader uniforms had acquired secondary trademark meaning (*Dallas Cowboys Cheerleaders v. Pussycat Cinema*, *Ltd*. 1979). The Cowboys sued Pussycat Cinemas for unauthorized use of the Dallas Cowboys' cheerleading uniforms in a pornographic video. In 1994, a federal district court ruled that, even though the owner of the Baltimore Colts had moved his franchise to Indianapolis and there was no longer an NFL team called the Baltimore Colts, the Canadian Football League (CFL) could not subsequently use the name "Baltimore CFL Colts" because it was likely to confuse a substantial number of consumers (*Indianapolis Colts, Inc. v. Metropolitan Baltimore Football Club*, *L.P*. 1994). This case also upheld the principle that a team "abandoning" a market did not necessarily establish the legal abandonment of its trademark rights. The NFL has also prevailed with respect to the challenges to its team nicknames on disparagement claims. Although the Trademark Trial and Appeal Board found that the Washington Redskins name was disparaging to Native Americans, the team's subsequent appeal to the U.S. District Court resulted in a finding in favor of the Redskins (*Pro-Football*, *Inc. v. Harjo* 2005).

While the NFL has historically prevailed against companies and organizations that could be deemed a threat to is stronghold in the licensing business, it is certainly ironic that the greatest threat to the success of its sponsorship division has come from internal lawsuits. The case of *National Football League Properties, Inc. v. Dallas Cowboys Football Club*, *Inc*. (1996) commenced in 1995 with "… a pivotal moment in the life of the league when Jerry Jones, the renegade owner of the Dallas Cowboys, walked onto the field during a Cowboys–Giants 'Monday Night Football' game, accompanied by Phil Knight, the chairman of Nike, to announce a deal that included 'stadium rights'—a hot new revenue source that would allow Nike to display its swoosh in the stadium" (Seabrook 1997).

This highly publicized event, quickly followed by announcements of the Cowboys' additional new sponsorship agreements with Dr. Pepper, Pepsi, and American Express (all in direct conflict with existing NFL sponsors) challenged the viability—and the spirit—of the NFL's Trust Agreement. All of these sponsorship contracts were signed through Jerry Jones' Texas Stadium Corporation, and Jones and his corporate partners were careful to avoid using the Cowboys name and logos in their advertising. However, the NFL alleged that these deals served as nothing more than a "stand-in" for the Cowboys and thus circumvented the club's obligations under the Trust Agreement.

As a result, NFL Properties filed a $300 million lawsuit against Jones in September 1995, claiming that he had entered into licensing and sponsorship arrangements that violated the league's revenue-sharing policies in violation of the Trust and License agreements the club signed in 1982 (*NFL v. Dallas Cowboys* 1996). Jones countersued for $700 million in federal court in New York, arguing that NFL Properties' centralized licensing and marketing role violated antitrust laws (Heath 1996).

In December, 1996, the two sides settled their lawsuits. Interestingly, during the discovery phase, the Cowboys provided evidence that several other NFL teams were engaged in local stadium sponsorships with companies that were not official NFL league-wide sponsors (Heath 1996). "We have said all along that our Texas Stadium deals are within the letter and spirit of the NFL rules, and the NFL has confirmed the legitimacy of our previous deals and given its blessing to our making new deals by dropping its suit," said Jones (Alm 1996).

Ironically, the legal tussle between the NFL and Jones served as the impetus to create a new and more lucrative model for the NFL's corporate sponsorship program. Jones' challenge to the old NFL model of both national and local exclusivity for corporate sponsors opened the doors to the incentives of local marketing (Alm 1998). For instance, in 1998, the NFL announced an official sponsorship with Coca-Cola in which the company secured exclusive rights to the NFL's trademarks (the NFL shield, the Super Bowl, and other NFL league-wide events), but the individual clubs retained the rights, for the first time, to make separate deals with Coke, Pepsi-Cola, Dr. Pepper, and other soft drink companies (Alm 1998). While Coke's national deal was estimated at $4 million per year (a huge decline from the $14 million reported for its previous deal), it was estimated that each team might sell its local rights for $1.5–2 million—in essence making Coke's total investment "a $60–70 million category" (Alm 1998). "We've got 30 … of the potentially finest marketing organizations in the country," said Jones. "That's what I want to maximize" (Alm 1998). Hence, as a result of the NFL–Jones disputes, the league emerged with a revenue model that enabled the league and its teams to "get their cake … and eat it too."

7.2.2 Copyright Issues

"This broadcast is copyright of the National Football League. The rebroadcast, retransmission, or any other use of this broadcast without the express written consent of the National Football League is strictly prohibited." Most sport fans can readily recite this copyright claim, heard during each and every broadcast of an NFL game (although few likely understand the legal significance of the statement). Though a short and simple statement, it is the linchpin upon which much of the NFL's economic growth depends. The Copyright Act, which protects any original works of authorship fixed in any tangible medium, has since its passage provided a significant source of protection through which the major professional sports leagues can combat the unauthorized use of NFL's broadcast signals (thus protecting the integrity of its multi-billion dollar national broadcast rights deals) (Copyright Act 1976). However, perhaps even more significantly, the copyright protection of its broadcast footage provides the NFL with the rich reservoir of broadcast footage that has turned NFL Films into a multi-billion dollar business.

When it comes to copyright protection, all of the professional sport leagues wage an ongoing battle against technological advancements. The NFL is no exception; in fact, given its popularity, the NFL is the biggest target for copyright infringers. Back in the mid-1980s, the advent of satellite dish technology led to a wave of lawsuits by the NFL against sports bars and other public establishments who were infringing on the NFL copyrights by "pirating" the satellite transmissions of NFL broadcasts and airing these games in their establishment, often charging a fee to their customers. The NFL was successful in halting this practice and, as technology has improved, the practice of encrypting telecasts, coupled with the licensing of telecasts for public viewing, had pretty much put this issue to rest—until recently.

During the 2010 season, in part due to the economic recession, the NFL experienced a situation in which nearly one-third of its teams had at least one home game that required being blacked-out in the home market per NFL policy. While one can debate the merits of the black-out rule (is it a relic of a bygone age of professional football?), the NFL took very seriously the alleged incidents of piracy of its telecasts that had been blacked-out. For instance, in October it was reported that the NFL believed some establishments illegally showed the blacked-out telecast of the Chargers–Cardinals game, even after the league sent letters to approximately 90 San Diego-area restaurants and bars, warning of the legal consequences of unauthorized use of the NFL copyrights (Posner 2010).

The emergence of the Internet, and social media in particular, has necessitated that all of the professional sport leagues aggressively step up the policing of their copyrights. Social media sites like YouTube, Facebook, and Ustream enable fans to instantly upload snippets—and sometimes even live games broadcasts—of the NFL's copyrighted material. Noted one reporter, "It is becoming increasingly apparent to many industry experts that the king of American professional sports leagues may be losing the battle of cyberspace, that the Internet sites carrying pirated NFL telecasts have become like gray hairs or dandelions in the backyard… transferring [a live broadcast off TV] to a computer and then the Internet is relatively easy" (Ziegler 2010). Because websites like www.Justin.tv or www.Ustream.tv "provide tens of thousands of channels at any given moment, self-monitoring is next to impossible even for sites legitimately concerned about copyright infringement. The NFL is then responsible for spending Sunday afternoons scouring cyberspace for unauthorized streams and then filing DMCA (Digital Millennium Copyright Act 2003) takedown notices" (Ziegler 2010). In short, any entity with a valid copyright infringement claim can immediately notify the website pursuant to the DMCA, which requires the removal of the allegedly infringing content. As the Internet becomes increasingly expansive, the task of protecting its copyrighted materials will become increasingly more complex.

The purpose of copyright protection is well founded: to incentivize creative works by enabling the "authors" to reap the financial rewards of their intellectual efforts. However, the Copyright Act provides certain limitations to copyright protection, perhaps the most significant of which is the so-called "fair use" exception. Section 107 contains a list of the various purposes for which the reproduction of a particular copyrighted work may be considered "fair," such as criticism (including parody), comment, news reporting, teaching, scholarship, and research. Indeed, the U.S. Supreme Court has said that fair use is an essential First Amendment protection because it ensures that the copyright monopoly is not allowed to become a limitation on vital freedoms of expression.

While it is not at all unusual for NFL game broadcast footage to be utilized for commentary or news reporting under the fair use doctrine, the use must fall within the four guidelines set forth in Section 107.[1] NFL regulations prohibit the use of

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[1] Section 107 of the Copyright Act sets out four factors that a court will consider in determining whether or not a particular use is fair: (1) the purpose and character of the use, including whether such use is of commercial nature or is for nonprofit educational purposes; (2) the nature of the copyrighted work; (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and (4) the effect of the use upon the potential market for, or value of, the copyrighted work.

NFL highlights from a game to be posted online. The only exception would be, for instance, if a news station simulcasts its evening news and during the sports report the station showed highlights. With respect to non-game day usage of NFL copyrighted material, accredited organizations may distribute online non-game audio and video content, including interviews, press conference, and team practices at NFL venues acquired as a result of credentialed access to games or club/league facilities provided that such distribution: (1) does not exceed 90 s maximum per day; (2) is not "archived" for more than 24 h; (3) appears in an editorial context only (no sponsorship, merchandising, or advertising integrated with or around the content); (4) is not live; and (5) is accompanied by links back to www.NFL.com and to the club's website (Personal Communication November 29, 2010). Such restrictions enable the NFL to control the usage of its copyrighted materials.

Although decades of case law have delineated the confines of "fair use," the NFL currently finds itself at the center of a pending lawsuit that threatens to substantially narrow the widely accepted definition of "fair use" of copyrighted materials. The case centers around the so-called "Flying B" logo used from 1996 to 1998 by the Baltimore Ravens, a logo that was later determined to have infringed Frederick Bouchat's copyright as the logo's original designer (*Bouchat v. Baltimore Ravens* 2000). Bouchat sued and won, and the Ravens have used a different logo since 1999. However, not content with this monetary victory, Bouchat subsequently sued the Ravens, the NFL, and NFL Productions, seeking to suppress every depiction of his copyrighted logo, including both its use in highlight videos produced and sold by NFL Films and its use in a display of Ravens' history within its corporate headquarters (*Bouchat v. Baltimore Ravens* 2010).

Although the district court denied Bouchat's claims, holding that these historical depictions were fair use, an appellate court reversed this decision. In its ruling, a divided three-judge panel upheld the Ravens' use of the logo in its headquarters lobby as fair use. However, in applying the four-part test to the use of the logo in highlight videos, the panel ruled that the use "serves the same purpose that it did when defendants first infringed Bouchat's copyrighted Shield logo design: the Flying B logo identifies the football player wearing it with the Baltimore Ravens" (*Bouchat v. Baltimore Ravens* 2010). Because of the potential for this pending case to redefine the rules on fair use with respect to historical depictions, it has drawn the interest (in the form of amicus briefs) from a variety of entities, including not only the other professional sport leagues, but also the Association of College and Research Libraries and the International Documentary Association (ARL Joins 2010). Among the NFL's and other organizations' most important arguments in its pending appeal is that for-profit use is not fatal to a fair use claim. Although the ultimate resolution of the case may have limited financial impact on the NFL given its confines to the Baltimore Ravens from 1996 to 1998 (essentially loss of revenues on Ravens old highlight videos or the need to air-brush out the old Flying B logo in all future uses), it does have the potential to establish new case law with respect to historical use of infringing logos.

7.2.3 The Potential Impact of the American Needle Case

One of the linchpins of the professional sport league licensing (merchandising) programs has been the ability to offer licenses on an exclusive basis (the same applies to corporate sponsorship). Although the pending *American Needle, Inc. v. National Football League* (2010) lawsuit has its basis in antitrust law, the ultimate outcome of the case has substantial potential ramifications for the NFL's licensing model (Masteralexis 2010).

As stated earlier, between 1963 and 2000, NFLP granted nonexclusive licenses to numerous vendors to manufacture apparel with team marks, logos, and colors. However, in 2000, the NFL teams voted to allow its then NFL Properties division to grant exclusive licenses. Embarking on the new exclusive rights strategy, the NFL awarded Reebok a 10-year exclusive license for consumer headwear and clothing bearing team logos and trademarks. The teams agreed amongst themselves and with Reebok that, pursuant to this agreement, they would not compete with each other in the licensing of headwear and clothing and that they would not permit any licenses to be granted to Reebok's competitors for the 10-year period. The NFL's decision to grant Reebok the exclusive license for apparel was not, however, without legal challenge. American Needle, a headwear licensee for over 20 years, suddenly found itself out of the NFL market. As a result, American Needle filed suit against the NFL and its teams, alleging that the exclusive licensing arrangement violated Section 1 of the Sherman Act (Sherman Antitrust ACT 2006).

American Needle argued that the NFL should be prohibited from granting an exclusive product license as such an agreement between its member teams constituted a "combination, contract or conspiracy" in restraint of trade, with the net effect for the consumer being a reduction in choice and increase in price for league-branded apparel. The NFL conversely argued that it was a single entity and hence immune from a Section 1 restraint of trade claim. The district court relied on the Seventh Circuit's decision in *Chicago Professional Sports Ltd. v. National Basketball Association* (1996) ("Bulls II"); in adopting a facet-by-facet analysis of league decision-making, the court granted summary judgment in favor of the NFL, concluding that the NFL was a single entity rather than a joint venture.

American Needle appealed this decision to the Seventh Circuit, which affirmed the district court ruling following its suggestion in *Bulls II* that leagues be evaluated on a facet-by-facet basis. The court further held that producing football games can only be carried out jointly and the "NFL teams share a vital economic interest in collectively promoting NFL football … [to] compet[e] with other forms of entertainment for an audience of finite (if extremely large) size, and the loss of [that] audience impacts the individual teams' success" (*American Needle* 2008). American Needle appealed to the U.S. Supreme Court, which in May, 2010 reversed the decision of the appellate court, holding that the NFL was a not a single entity when promoting NFL football by licensing the teams' intellectual property (*American Needle* 2010). The Court held that each of the teams is a substantial, independently owned and independently managed business. More specifically, the Court noted that NFL teams "compete with one another, not only on the playing field, but to attract fans, for gate receipts, and for contracts with managerial and playing personnel" (*American Needle* 2010).

The Court further held that NFL teams do compete in the market for intellectual property, a fact directly relevant to the question of whether the NFL is a single entity. It noted that "[t]o a firm making hats, the Saints and Colts are two potentially competing suppliers of valuable trademarks" (*American Needle* 2010). As the Court suggested, although the NFL teams may have common interests in promoting the NFL brand, the teams could be viewed as separate, profit-maximizing entities whose interests are not necessarily aligned; simply because the NFL's business unit is a separate corporation with its own management and equal revenue sharing does not make it a single entity. The Court remanded the case and instructed the district court to reexamine the case under the rule of reason, a defense that provides flexibility by allowing for market restraints provided that they are reasonable (the defendant can demonstrate that the pro-competitive effects of the restraint outweigh the anti-competitive impacts of the restraint). In other words, if the NFL can prove that its exclusive licensing deal with Reebok was more pro-competitive than anti-competitive, the NFL's exclusive licensing policy will withstand judicial scrutiny (Masteralexis 2010).

The nature of league-wide licensing programs based on exclusivities points to positive arguments for the NFL in terms of pro-competitiveness. For instance, such licensing programs can (1) generate efficiencies for manufacturers in the form of lowered costs for licensees (while potentially allowing them to put more capital into research and development); (2) lower costs to consumers; and (3) provide greater incentive for licensees to create new and innovative products (Masteralexis 2010). In addition, the NFL can raise as justifications for their exclusive licensing deals the need for unified branding, as well as the ability to control the quality, fit, and style of the products (Masteralexis 2010). Although based on past case law, the prospects of the NFL losing are remote, a ruling in favor of American Needle would have far-reaching effects on the sport licensing business, and put in jeopardy the significant apparel licensing deals concluded by the NFL in October 2010—whereby, ironically, it was *Reebok* who lost its exclusive apparel license with the NFL!

7.3 NFL Business Structure and Policies

Before examining the NFL's licensing and sponsorship business in detail, it is important to understand the league's overarching business structure, as well as the policies that guide the relationship between the teams and the league headquarters. The business side of the NFL is divided into two main divisions called NFL Business Ventures and NFL Media. NFL Business Ventures, currently overseen by NFL Executive Vice President Eric Grubman, encompasses Consumer Products (essentially, the licensing unit), Marketing, Corporate Development, NFL International, and Events. NFL Media, currently headed by Executive Vice President Steve Bornstein, includes: NFL Network, www.NFL.com, NFL Films (the expansive reservoir of the NFL's copyrighted materials), and Sales (which includes the corporate sponsorship department).

The NFL is somewhat unique among the four major professional sport leagues in the control and integration that it maintains over its intellectual property. Specifically, the NFL packages and sells all of its digital, marketing, and media rights under one roof.[2] Hence, if a national company is interested in an association with the NFL, it is able to "one-stop-shop" for sponsorship and/or advertising rights for both digital and off-line platforms. This enables the NFL to not only best meet the needs of potential corporate partners, but also to best leverage its different assets to achieve maximum profitability (in other words, if a company wants off-line official sponsorship, it may be required to also purchase digital media rights as well). This "one-stop-shop" model also prevents the buyer and seller conflicts currently experienced by Major League Baseball, which sells its digital and marketing rights separately and whose "two fiefdoms have left the rest of the industry shaking their heads for years" (Lefton and Ourand 2010).

Although no longer the economic engine that fueled the NFL and its teams in the 1980s and early 1990s, the licensing and sponsorship functions remain among the core means through which the NFL leverages its intellectual property rights, particularly with respect to its trademarks.

The issue of team logo ownership is a threshold question in understanding the NFL's licensing and sponsorship model. Unlike the National Basketball Association and Major League Soccer, in which the league owns all of the team trademarks, the NFL (like MLB and the NHL) does not legally own the trademarks of its individual teams. Instead, it has technical ownership of the team marks through the NFL Trust, an arrangement that provides NFL Business Ventures and NFL Media with the rights to market and sell the league and its teams collectively, while also providing some restrictions on the local teams' usage of the trademarks in order to best protect the financial integrity of its national licensing and sponsorship programs.

Unlike sponsorship, where there is much more individual team latitude, licensing is controlled entirely through NFL headquarters, a process which ensures (1) economies of scale for both licensor and licensee, and (2) quality control. Hence, a company seeking to secure a license for a product or service must negotiate through the league office and will typically pay the NFL a royalty based on the wholesale (not retail) cost of the product (royalty rates typically range between 8 and 12% depending on the nature of the product). Like its counterparts in the other professional leagues, licensing contracts also typically include: (1) a guarantee against royalties (to ensure the licensee's commitment to producing and marketing its product or

[2] Like the NFL, the NHL also uses a similar "one-stop-shop" model for packaging and selling its digital and marketing rights. The NBA and NASCAR have hired Turner Broadcasting to manage their digital operations while selling digital rights to their other network partners (Lefton and Ourand 2010).

service), and (2) a "forced" commitment to advertise the licensed product or service in NFL-controlled media such as NFL Network (television), www.NFL.com or the commemorative Super Bowl magazine.

Local NFL teams are granted a limited number of exceptions each year for the purpose of licensing initiatives that work purely on a local level for items that are specifically attractive to an individual team's fan base. One example would be the Green Bay Packers' ability to work with a manufacturer to obtain a license for foam Cheeseheads that fans wear on their head. Given that the Consumer Goods division would require this company to manufacture Cheeseheads for all 32 teams, a league-wide deal would not make sense. Hence, the Packers can use one of its exceptions to secure a local license for Cheeseheads. The Cheeseheads manufacturer must go through the NFL's approval process to secure the license and the royalties are paid directly to the NFL and then shared proportionately among all of the teams. However, the local team (in this case the Packers) is entitled to sell the Cheeseheads through their own retail channels (e.g., team stores or stadium concessionaires) and retain the profits from the sale of the Cheeseheads. Another potential revenue stream for the team is to align the product with a sponsor and retain the sponsorship revenue (for instance, including a local sponsor name on the item as part of an in-stadium giveaway). For example, a team could go to a local food retailer and jointly create a private label ice cream cake (e.g., "St. Louis Rams Ice Cream Cake"). Although the use of the Rams' intellectual property would need to be licensed through the NFL Consumer Goods division, the Rams could keep a share of the profits from the sale of the cakes within the grocery store. Again, this exception allows for teams to capitalize financially on products that have great appeal within a specific market but otherwise limited appeal in the other NFL markets.

Unlike licensing, in which the league headquarters is the central point of control, the local teams have much more leeway in the area of sponsorships. The league office sells and services its national official sponsors. Such sponsorship agreements provide corporations with the use of the NFL-owned trademarks (e.g., NFL Shield, Super Bowl, Kick-Off Weekend, Pro Bowl) as well as the *collective* use of the 32 NFL team marks in promotion and advertising (although an official sponsor's national advertising campaign can utilize the marks of an individual team provided the team approves such usage).

In the early days of the NFL's official sponsor program, a national company secured exclusivity not only on a national level, but also in each of the individual NFL markets. Over the years, however, this model has eroded under pressure from owners such as Jerry Jones and Robert Kraft. As a result, more sponsorship rights have reverted back to the teams; today, only one sponsor (Gatorade in the isotonic beverage category) retains product/service category exclusivity on both the national and local market levels. Otherwise, local teams retain exclusive sponsorship rights within a 75-mile radius around their home stadium (and nonexclusive rights for the rest of the state that is not within the exclusive territory of another team(s)). "This arrangement," noted one NFL team president, "enables us as a league to sell on both sides of the street" (Personal Communication October 13, 2010).

7.4 A Look Inside NFL Licensing

Historically, the NFL has been by far the most selective of the professional sports leagues when it comes to granting the use of its trademarks for consumer licensing purposes.[3] The NFL's Consumer Goods division encompasses both so-called "hard goods" (non-apparel licensed products, including video games) and "soft goods" (apparel and apparel-related licensed products).

In October 2010, the NFL made significant news by signing Nike, among other companies, to new licensing agreements. These deals ended the NFL's 10-year contract with Reebok (with the conclusion of the 2011 season), which had included exclusive rights for on-field uniforms, sideline apparel, practice apparel, NFL-branded footwear, and an NFL-branded apparel line. In breaking up its apparel category and signing multiple brands in the athletic performance category on both domestic and global levels, the NFL saw the opportunity to maximize revenues in these critical product categories. "We are transitioning to a model where there will be different brands, performance athletic brands people would expect to see on NFL fields," said Leo Kane, the league's vice president of consumer products (Lefton 2010c). The biggest winner in what was essentially a high-stakes auction of NFL intellectual property rights was Nike, which in supplanting Reebok secured the rights to manufacture and supply NFL jerseys for a 5-year period beginning with the 2012 season. The deal left rivals Under Armour and Adidas without any significant NFL rights. In addition to NFL jersey rights, Nike will also have exclusive rights to the NFL sideline apparel, coaches wear, lifestyle fan wear, under-layer moisture wicking apparel (Under Armour's core product) and the NFL training line (Lefton 2010c). At the same time, Nike also renewed its on-field glove and footwear rights. Further leveraging Nike's new behemoth relationship with the NFL is the fact that it also has 75% of the NFL players under contract (Lefton 2010c). "Switching from a master on-field license to multiple brands was expected," wrote industry expert Terry Lefton, "considering how specialized different sides of the licensing business have become" (Lefton 2010c).

In a bold move by a long-time MLB cap licensee, New Era secured for the first time the on-field cap rights for the NFL, both domestically and globally. New Era's CEO Chris Koch estimated the new NFL license will generate an incremental six million caps annually (Lefton 2010c). VF, a 25-year NFL licensee, secured global fan-wear rights, while GIII secured rights for jackets and fan wear. Under Armour, which had hoped to secure on-field rights, kept its rights to sponsor and manufacture

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[3] It is indeed ironic that while colleges and universities continue to make headlines for suing high schools for using like or similar logos and nicknames on high school uniforms, and in 2009 Major League Baseball made headlines for threatening to sue Cape Cod Summer League teams over the use of MLB team logos and nicknames on their uniforms, the NFL "ethos encourages high schools" to utilize its logos on uniforms. "We think it's great if a local team wants to use a logo of an NFL team," said league spokesman Brian McCarthy. "We think it's a great opportunity to inspire kids to 1 day play in the NFL and wear the real helmet" (Sudano 2010).

togs around the NFL Combine. Twins got fan headwear for the mid-tier and mass department store category, and Outerstuff retained its kids apparel rights (Lefton 2010c). These agreements illustrate how finely the apparel category has been sliced and diced by the NFL moving forward.

Regardless of the NFL's licensing strategy, official NFL jerseys have always been one of the most popular items. For the period of April 1 through October 31, 2010, the following is a list of the top selling official jerseys (TSJ Staff 2010):

1. Tim Tebow—Denver Broncos
2. Drew Brees—New Orleans Saints
3. Troy Polamalu—Pittsburgh Steelers
4. Peyton Manning—Indianapolis Colts
5. Brett Favre—Minnesota Vikings
6. Aaron Rodgers—Green Bay Packers
7. Tom Brady—New England Patriots
8. Miles Austin—Dallas Cowboys
9. Donovan McNabb—Washington Redskins
10. Tony Romo—Dallas Cowboys
11. Mark Sanchez—New York Jets
12. Eli Manning—New York Giants
13. DeSean Jackson—Philadelphia Eagles
14. Larry Fitzgerald—Arizona Cardinals
15. Adrian Peterson—Minnesota Vikings
16. Jason Witten—Dallas Cowboys
17. Philip Rivers—San Diego Chargers
18. Chris Johnson—Tennessee Titans
19. Patrick Willis—San Francisco 49ers
20. Sam Bradford—St. Louis Rams
21. Ray Rice—Baltimore Ravens
22. Darrelle Revis—New York Jets
23. Chad Ochocinco—Cincinnati Bengals
24. Brian Urlacher—Chicago Bears
25. Wes Welker—New England Patriots

The continued growth of the NFL's licensing revenues is fueled by the ongoing development of new product lines that tap into new markets. For instance, in 2010, the Consumer Goods division launched its "Fit for You" women's fashion line, targeted toward 29–40-year-old females and available even in junior and maternity sizes. This collection alone includes literally thousands of new products ranging from logoed jeans to branded yoga mats to purses made of recycled license plates (Vega 2010). Another growth market for the NFL is in what is called "hot market" merchandising—the licensing of products tied specifically to special occurrences or events (e.g., championship games). For example, immediately following the conclusion of each Super Bowl, the league rolls out a line of "Trophy Collection" products ranging from T-shirts and caps, to mugs and towels. With traditional categories like apparel (including headwear), videos, and trading cards having matured, innovation in the form of new product categories, lines, and extensions has become critical for enhancing revenue growth, especially since "nearly half of the NFL's income from licensed goods comes from apparel and headwear" (by comparison, apparel and headwear make up only 32% of the NBA's income from licensed goods) (Belson 2010).

Among the varied licensed product manufacturers is Wild Sales, an Indiana-based marketer of NFL-logoed office chairs who in 2010 joined the NFL's $1 million-plus royalty club for the first time. Domestic and house-ware goods remain another growth category for the NFL, and one manufacturer has had enough success with NFL-licensed pet products that it recently secured an exclusive license in this category. From NFL- and team-branded women's swimwear and packaging tape and hand sanitizers, to screwdrivers and Saints-logoed pizza cutters that play the tune "When the Saints Go Marching In," there appears to be no boundaries to how imagination and innovation continue to drive the retail merchandising of the NFL brand both online and at "brick-and-mortar" locations. The growing acceptance and popularity of e-commerce has only served to broaden the retail opportunities for NFL-licensed products, as sites like www.nflshop.com provide a wide variety of licensed products for sale in one online location.

Counterfeiting, of course, is a serious issue with economic consequences for all of the professional sport leagues. To combat this, the leagues have adopted holographic technology that is placed on licensed merchandise as well as playoff tickets. Holographic companies provide not only the production of uniquely numbered security labels and hangtags complete with holograms, but also allow for important fulfillment and tracking services. Holographic technology enables licensors like the NFL to not only protect the brand, but also to better track royalty payments due to the league (Holograms 2009). Holograms provide a strong deterrent that prevents not only counterfeiting but also "grey market diversion, as underreporting (of royalty-bearing merchandise) becomes highly visible and out-of-territory sales are easily traceable. And, through the use of enforcement teams, the authenticity of official merchandise can be checked and verified in the field" (Holograms 2009).

7.5 A Look Inside Corporate Sponsorship

Although revenues pale in comparison to those realized through the licensing and broadcast divisions, the NFL's corporate sponsorship program nonetheless is among the leaders within the professional sports world in terms of annual revenues. Table 7.1 provides the list of NFL official sponsors (with their exclusive product/service category) for the 2010 season.

The NFL's corporate sponsorship program is typical to that of the other major professional sport leagues. Companies sign multi-year agreements for rights that include: "official sponsor" designations; product or service category exclusivity on a national level; rights to utilize the NFL Shield and special event marks (e.g., Super Bowl logo), as well as the *collective* use of the NFL team marks in promotion and advertising; and access to special event ticket packages. In exchange, the company provides the NFL with cash or in-kind product/service, as well as some level of commitment to expenditures in or on NFL-controlled media such as the NFL

Table 7.1 List of official NFL sponsors for the 2010 season

Company	Category/products
Barclays	NFL affinity credit cards
Bridgestone	Automotive tires
Campbell Soup Company	Soup
Canon USA	Cameras, camera equipment, binoculars/field glasses, photo printers, camcorders
Coors Brewing Company	Beer
DMI	Milk products
EA	Video games
Febreze	Fabric care/air care
Fedex-Kinkos	Package delivery services
Frito-Lay	Salted snacks/popcorn/peanuts/peanut products/salsa/dips
Gatorade	Sports beverages (isotonic)
General Motors	Passenger cars and passenger trucks
Gillette	OTC grooming products
Head & Shoulders	OTC grooming products
IBM	Computer hardware and software, IT services
Mars Snackfood	Chocolate and non-chocolate candy products
Motorola	Wireless telecommunications equipment
News America	Super bowl FSI
Old Spice	OTC grooming products
Papa John's	Pizza carry-out/delivery
Pepsi	Soft drink, juices, teas
Prilosec OTC	Heartburn medication
Verizon	Wireless telecommunications services
Vicks	OTC cold and flu remedy
VISA	Payment systems services
National Guard[a]	US military

[a]Promotional partner (has limited rights and in most instances is limited to specific calendar marketing windows)

Network, www.NFL.com and the Super Bowl commemorative program magazine. Most of the national sponsorship deals also often include a financial commitment to local team spending. Official sponsorship agreements enable corporations to achieve a variety of objectives, including: position enhancement (such as increased market share and sales); status enhancement (the altering of public perception and corporate image); trade networking (enhancement of trade relations and trade goodwill); and public service (corporate philanthropy and social responsibility) (Irwin and Sutton 1994). From the NFL's perspective, official sponsorship programs, when effectively activated by the sponsoring company, provide a tremendous amount of media and retail exposure for the NFL and its team brands.

The revenues received through its corporate sponsorship program are shared equally amongst the 32 teams (after taxes and operating expenses). Corporate sponsorship agreements inked in advance of the 2010 season illustrate the value and benefits associated with aligning with the NFL.

7.6 Anheuser-Busch: NFL Cracks $1B Mark

In 2002, Coors stunned the sports business world by out-bidding long-time NFL heavyweights Miller and Anheuser-Busch for the “official beer” status of the NFL (McCarthy 2002). At the time, Anheuser-Busch rationalized its decision by stating that “the NFL’s equity was largely at the team level and shifted budgets to club sponsorships” (Lefton 2010a). The beer category had until this deal been muddied by the fact that Miller owned the intellectual property rights to the Super Bowl, while Anheuser-Busch has long held category exclusivity within the television broadcast of the Super Bowl.

In May 2010, Anheuser-Busch announced the largest sport sponsorship deal in its history: the signing of a 6-year league sponsorship replacing MillerCoors beginning with the 2011 season (the companies merged in 2008). The NFL positioned the deal as its first billion-dollar sponsorship with an “all-in price” of $1.2 billion over the 6 years, including rights fees, marketing, media, and team spending commitments (more than double the previous Coors deal).[4] Sources within the NFL stated off the record that the rights fees alone for the first year of the deal (2011) are $43 million and increase to $50 million over the life of the deal (Lefton 2010a). Anheuser-Busch CEO Dave Peacock noted: “We needed to reinforce our commitment to marketing, show it’s a critical component of what we do, and remember we are from the ‘show me’ state” (Lefton 2010a).

For consumer products like the beer category, the majority of the battle is won at the retail level. In addition to local deals with 28 of the league’s 32 clubs and the procurement of NFL and Super Bowl rights across the board for the first time ever, Anheuser-Busch executives are “wondering what the combination of Super Bowl advertising exclusivity (a 22-year legacy, extended for an additional 4 years through the deal), along with Super Bowl logos, will allow them to do. Without them, Anheuser-Busch has never been able to produce a Super Bowl [commemorative beer] can. It’s been unable to supply its wholesalers with Super Bowl point-of-sale advertising to grab valuable retail floor space” (Lefton 2010a).

[4] Upon learning of Anheuser-Busch’s new megadeal with the NFL, MLB commenced the process of reneging on the multi-year renewal of its long-term official sponsorship relationship that had allegedly been agreed upon in April 2010. As a result, in November 2010, Anheuser-Busch filed suit in federal court claiming that MLB Properties “agreed to renew its rights to be the league’s official beer sponsor in April but then demanded to renegotiate the pact.” The lawsuit alleges that “after the NFL deal was announced, MLB Properties began to complain that the economic terms of the renewal were no longer satisfactory and that the market had changed.” The lawsuit also alleged that MLB Properties demanded on May 27 that Anheuser-Busch “agree to pay much higher fees to remain the official sponsor,” or MLB Properties would “offer the sponsorship rights to the company’s competitors” (Bray and Kesmodel 2010).

7.7 Barclays: A British Invasion

In the late 1980s, a new sponsorship category emerged in the form of sports affinity credit cards. Credit cards affiliated with sports teams, universities and other special-interest ventures have been growing and consolidating amid the financial shakeout of the past decade (Fredrix 2010). Like the hard-fought competition between Anheuser-Busch and MillerCoors for rights to the NFL, the credit card category has recently been of equal intrigue and financial interest to the NFL, which in addition to receiving an initial rights fee payment also retains a cut of the revenues generated through card usage by fans who sign up for the team-logoed cards. In July of 2010, the NFL announced the end of its long-term sponsorship deal with Bank of America (dating back to 1995) and the signing of Britain-based Barclays as the new multi-year sponsor of its branded credit card business—and its first-ever national sponsor headquartered outside of the United States (Fredrix 2010). The deal provides Barclays with a further foothold in the U.S. sport marketplace, building on its $300 million marketing partnership with the New Jersey Nets (that includes naming rights for their new NBA arena in Brooklyn) and its entitlement sponsorship of the PGA Tour's Barclays Tournament.

Sponsorship with the NFL provides Barclays with a platform for not only credit card sales, but as importantly the opportunity to generate instant brand awareness and credibility through an association with arguably the most prestigious brand in U.S. sports: the NFL. Barclays' U.S. credit card business is currently relatively small, coming in 11th behind American Express, Citibank, Discover, and others (Fredrix 2010).

Although it was not publicly revealed as to the "sticking point" in the NFL's negotiations with Bank of America for a sponsorship contract extension, industry sources speculated that it may have been the NFL's refusal to include debit cards within the exclusive product category and/or the teams' unwillingness to cede their local marketing rights to Bank of America (Fredrix 2010). The deal with Barclays illustrates how finely cut the exclusive categories have become (arguably, the agreement with Barclays enables the NFL to sell the debit card category to another bank!). Additionally, the bank bought only the rights to market the cards, not the existing accounts, so it will have to convert cardholders. Cardholders who don't switch will have the same accounts with Bank of America but no ability to earn points to be redeemed for jerseys, tickets and other NFL merchandise (Fredrix 2010). The switch from Bank of America to Barclays also illustrates some of the practical business challenges for sponsors who need to conclude their official relationship with a league. For instance, Bank of America's consumers with team-logoed credit cards had to scramble to spend/redeem their "NFL Reward Points" before the program expired in August 2010 (Bank of America featured a giant countdown clock ticking away the time on the program's site).

7.8 Verizon Wireless: The Age of Convergence Arrives

No deal better illustrates the rapid convergence of traditional sponsorship and digital media rights than that struck by the NFL in March 2010 with Verizon Wireless for a reported $720 million over 4 years, replacing Sprint (the NFL's telecom sponsor since 2005). When asked whether the Verizon Wireless deal was a sponsorship agreement or a media-rights deal, the senior vice president of digital media Brian Rolapp responded, with a chuckle: "Yes" (Ourand and Lefton 2010). "His ambiguity makes sense. It's 2010 and the deal suggests that the long-promised world of convergence is finally here. It's not just the combination of video and mobile platforms, but it also marks the biggest overlap between a sponsorship and media deal in American sports league history. Verizon's …deal to replace Sprint as the league's exclusive wireless partner instantly becomes the NFL's most valuable, a league spokesman said" (Ourand and Lefton 2010).

As part of the deal, Verizon secured the traditional official sponsorship trademark rights and designations. In addition, Verizon secured rights to stream full games from NBC's "Sunday Night Football" and the full slate of action on NFL Network, as well as the rights to stream the highly popular NFL RedZone Channel that offers live look-ins to NFL games (Ourand and Lefton 2010; Corbett 2010). "When Sprint signed [in 2005], it smelled a lot like a sponsorship deal," said Rolapp. "Five years later it smells more like a content deal. You are talking about a landscape that is really in transition—so this deal is a bit of both" (Ourand and Lefton 2010). Interestingly, entering the 2010 season, Sprint maintained sponsorship deals with eight NFL teams, so a locally based NFL platform—as well as one based on NFL media buys with the NFL's rightsholders—is a possibility for Sprint to keep a hand in the game.

7.9 Single Event Sponsorships

The focus of the NFL's corporate sponsorship division, like that of the other major professional leagues, is to negotiate fully integrated multi-year deals. Given their leverage, the leagues typically deny the request of national companies to align with one of their premier events absent a larger multi-year commitment to support the league throughout the entire season. In other words, the leagues have been reticent to allow national companies the opportunity to "cherry-pick" an association with the league's marquee events, as promotional access to these events is typically the primary hook for securing an official league-wide sponsor on a multi-year basis. However, on occasion it makes financial sense to do so, particularly if it provides a "value-add" to a substantial media buy with one of the NFL's broadcast partners. For instance, in advance of Super Bowl XLIV (in February of 2010), the NFL entered into an agreement enabling Papa John's to utilize the cherished Super Bowl logo in a media and promotional campaign marketing a "Super XL IV Pizza" (extra-large with four toppings) for $11.99 (Papa John's Rides 2010). On Super Bowl XLIV Sunday, Papa John's recorded its largest single sales day in the brand's history, selling more than 900,000 pizzas at its 2,800 U.S. restaurants (Papa John's Pizza 2010). Providing Papa John's with a "taste" of the power of the NFL brand scored big dividends for the NFL 4 months later when, on the basis of these outstanding sales results, Papa John's entered into a 3-year league-wide deal as official carry-out/delivery pizza sponsor of the NFL (note the continued slicing and dicing of these product categories, pun intended!). In addition, Papa John's negotiated deals on the local team level to secure the Official Pizza status of teams including the Arizona Cardinals, Atlanta Falcons, Baltimore Ravens, Dallas Cowboys, Houston Texans, Miami Dolphins, New York Jets, New York Giants, and Tennessee Titans. These team deals require incremental rights fees to the teams, while enabling Papa John's to further tap into the passion of consumers on the local market level. These deals typically also incorporate the right to sell its product at various venues within the stadium (concession stands, suite and club seating menus).

The NFL used a similar limited-rights model in November 2010 to sign upscale clothing company Phillips-Van Heusen to a short-term sponsorship in support of its traditional Thanksgiving Day game broadcasts (Lefton 2010d). This sponsorship deal extended Phillips-Van Heusen's official sponsorship of the Pro Football Hall of Fame, and included in-game mentions in CBS' and Fox's game telecasts, integration with NFL Network studio shows and sponsorship of the Thanksgiving weekend's Sunday game. The apparel marketer also received use of the NFL shield logo and rights to use the NFL's archive footage (the rights to such footage typically costs around $100,000 per 30 s) in in-game advertising enhancements. The official sponsorship package of rights supported Phillips-Van Heusen's "Fan's Choice" Hall of Fame voting campaign. In addition to enabling Phillips-Van Heusen to enhance its sponsorship of the Hall of Fame, a limited license such as this may, as occurred with Papa John's, set the stage for a much larger, multi-year league-wide official sponsorship in the future.

7.10 The Impact of Ambush Marketing

The license to leverage the NFL's premier event—the Super Bowl—is arguably the most important asset afforded national official sponsors. However, a major threat to the impact of official sponsorships—as well as to the integrity of the NFL's corporate sponsorship program—is ambush marketing, a tactic whereby non-sponsor companies seek to affiliate themselves with an event without paying the requisite sponsorship fees. Every year shortly before the Super Bowl, advertisers exhort fans to "get ready for the Big Game" with a new television set, "stock up for the Big Game" with pizza and ice cream, score "Big Game Savings" on potato chips, or "Win tickets to the Big Game" by entering a sweepstakes.

Although only official NFL sponsors are licensed to utilize the logo and phrase "Super Bowl," the use of the phrase "The Big Game" has become "an American marketing ritual, a kind of nudge-nudge, wink-wink around existing trademark law"

(Sandomir 2010). Companies intent on ambushing the Super Bowl are savvy enough to avoid the use of the NFL's federally registered Super Bowl marks, typically gaining their Super Bowl association through the use of "The Big Game" in conjunction with generic football-themed advertising.

In 2006, in an effort to combat the prevalence of Super Bowl-related ambush marketing, the NFL applied for a federal trademark for "Big Game" even though another Big Game (the annual one between Stanford University and the University of California) dates to 1892, 75 years before the inaugural Super Bowl. The two universities filed objections to the NFL's application with the United States Patent and Trademark Office, as did numerous companies, including Anheuser-Busch, KFC, Papa John's, Time Warner Cable, Domino's Pizza, Yum Brands, and Dell. In 2007, the league withdrew its request for the "Big Game" trademark (Sandomir 2010).

Craig Mende, a lawyer who represented nine companies opposed to the league's "Big Game" trademark filing, remarked: "[The companies] had gone along with the NFL's desire that if they didn't have licenses, they should not be able to use 'Super Bowl.' But to force people not to use 'Big Game' made it impossible for companies to fairly communicate what they might do around the Super Bowl. It seemed that the league was overreaching" (Sandomir 2010).

One popular avenue of ambush marketing is to purchase television advertising with the Super Bowl network's local affiliates (Anheuser-Busch owns the exclusive advertising rights for the national broadcast network). For instance, in 2010, MillerCoors' High Life brand ran an online campaign utilizing "The Big Game" that was supported through commercial time it bought on CBS affiliates, not the network (Sandomir 2010). Miller's campaign featured ads with small-business owners from around the country, designed to promote their beer sales. In addition, its Miller Lite brand auctioned the chance for a fan to play host to the Hall of Fame running back Barry Sanders at home to watch the Big Game.

Gary Gertzog, the league's general counsel, said: "There's been a decades-long practice of companies that do not have the official rights trying to create the mistaken impression that they do. They try to come up with clever ways to garner the association" (Sandomir 2010). Granted, companies that use "Big Game" as a substitute for "Super Bowl" can potentially run afoul of the league's rights by combining it with other elements such as the game's location, a depiction of the stadium or the names of the teams or the players. Historically, however, companies are savvy enough to avoid any activity that elevates to the level of trademark infringement and, as a result, the NFL has yet to pursue a lawsuit against a company based on ambush marketing of the Super Bowl.

7.11 Creation of New Revenue Streams

In addition to its long-time special events like the Super Bowl and Pro Bowl, the NFL has aggressively pursued the creation of new and proprietary "properties" (special events each with their own portfolio of federally trademarked logos) around which to build its brands and generate additional revenues. Additionally, although in its infancy in terms of revenue-generation, fantasy football games are also an emerging property for the NFL due to their popularity.

7.12 NFL Back to Football

Among these newly created proprietary properties is "NFL Back to Football," the league's initiative designed to leverage the 10-week period from late July (the start of training camps) to kickoff weekend. Many of the 32 clubs have incorporated the slogan into their local marketing plans. The "Back to Football" campaign also provides creative ways to engage its official sponsors and add value to their sponsorship, while also generating excitement for the NFL brand at the start of the season. Through the magic of video-conferencing, Commissioner Roger Goodell and a handful of team owners and players led "Back to Football Friday" rallies at a number of sponsor headquarters 2 days before the start of the 2010 season (Lefton 2010b). Twenty-one of the league's corporate sponsors, including Barclays, PepsiCo, EA Sports, and Papa John's held rallies for employees that included Commissioner Goodell's "pep talk," football-themed raffles and employees being encouraged to wear their NFL apparel. The efforts also had a competitive significance for the participating sponsor companies. The sponsor registering the highest percentage of headquarters-employee support via Web registration and deemed to show the most NFL pride were rewarded with Super Bowl tickets and "a prize at the heart of the NFL's business model—national commercial recognition" (Lefton 2010b). The most creative sponsor, as determined by photo submissions of employees expressing their NFL loyalties and decided by the league, were rewarded with a 30-s thank-you promo filmed by NFL Films and aired during an NFL game (Lefton 2010b). Of course, the "Back to Football" campaign is more than a "feel-good" opportunity for sponsors. Three national retailers (Kohl's, Old Navy, and Dick's Sporting Goods) supported the 2010 campaign with television ads and in-store merchandising displays of NFL products. All told, the NFL invests a reported $50 million in an effort to brand the start of the season, with its initiatives reaching into schools, offices, sponsor companies, broadcasters, and retailers (Kaplan 2010b).

7.13 NFL Kickoff Weekend

The NFL Kickoff Game was introduced during the 2002 season as part of the NFL's marketing efforts to highlight the start of football season. Since 2004, the Kickoff Game has been hosted by the defending Super Bowl champion. In 2010, the game featured the defending champion New Orleans Saints playing host to the Minnesota Vikings in what became the highest rated NFL Kickoff Game ever with over 27 million viewers, a major increase over the ten million viewers from the first game in

2002 (Seidman 2010). The 2010 game also had a special pregame show "NFL Opening Kickoff 2010 Presented by EA Sports" which featured performances by Taylor Swift and Dave Matthews Band (Back to Football 2010). As demonstrated by the presenting sponsor of the pregame show, the NFL Kickoff Game has provided additional means for the NFL to engage its official sponsors and add value and excitement to the sponsorships. In addition, the game acts as a marquee event for the television partner, as evidenced by NBC's commitment to advertising the 2010 game across its platform of networks and shows, including shows "Today" and "NBC Nightly News" broadcasting live on-site and others like "Access Hollywood" and "Wake up With Al" delivering live reports from New Orleans (Weprin 2010). All of this means additional exposure for the NFL and the increased interest and revenue that come with it.

7.14 Fantasy Football

In recent years, fantasy football has witnessed an explosion in popularity as the activity has gone more mainstream. By one estimate, fantasy football has over 28 million players, a figure that has been consistently rising each year (Kephart 2010). The NFL has embraced this trend, devoting television time and ads to fantasy football as well as creating their own fantasy site through www.NFL.com. The reason for this is simple: fantasy football draws viewers toward non-marquee games and also extends the appeal of the sport beyond hard-core fans. But beyond that, fantasy football itself is an estimated $800 million industry, with players having an average household income of $81,000 (Gregory 2009). To gain a greater piece of this lucrative market, the NFL has ramped up efforts of late to draw players into their version and away from rivals such as Yahoo, ESPN, and CBS Sports. Part of this effort is a new online fantasy football show that runs live on www.NFL.com every Sunday (Fisher 2010). Although the most popular fantasy football application on www.NFL.com is free, increased registration drives traffic to the site and to all of its associated content, which increases the appeal to advertisers. Coupled with some premium memberships, fantasy football thus adds to the appeal and revenue generating potential of the NFL's emerging digital landscape.

7.15 NFL International Series

The first regular season NFL game played outside of the United States occurred in 2005, with the Arizona Cardinals playing the San Francisco 49ers in Mexico. That inaugural game drew the largest crowd in NFL history (over 103,000) and thus paved the way for a continuation of this new branded property called "NFL International Series" which, among other things, drives incremental retail sales of branded merchandise that features the logos of the two competing teams and commemorates the annual event. Since 2007, the NFL International Series has featured one game a year in London, England. All four London games through the 2010 season sold out with over 85,000 fans, and the television ratings for the game have increased by 50% each of the past 2 years (Berger 2010). The league's success in London has led to speculation of additional games per year being hosted abroad as well as a potential Super Bowl or expansion franchise overseas. Said John York, owner of the San Francisco 49ers and chair of the NFL's international committee: "There is easily enough of a fan base [in London] to stage two games a season. I think eventually there will be a Super Bowl outside the U.S…I'm not sure what will be first, a Super Bowl [in London] or an NFL team, but they both seem likely to happen" (Maidment 2010). Any of these developments would represent a major step toward extending the NFL brand into previously untapped foreign markets and opening up their vast new audiences and associated revenues.

7.16 Patriot Place: A New Model for Ancillary Revenue

In 2007, Patriot Place, a 700-acre open-air shopping and entertainment center adjacent to Gillette Stadium (home of the New England Patriots) opened. Patriot Place is owned by the Kraft Group, which also owns the New England Patriots. Despite the name, Patriot Place has no direct affiliation with the Patriots or the NFL in general, and thus all revenues generated by business at Patriot Place are retained by the Kraft Group. Although there is no direct usage of team or league marks within Patriot Place, the Patriot name coupled with the location certainly suggests a New England Patriots affiliation. This notion is furthered by the recent opening of the CBS Scene, a restaurant and bar featuring numerous televisions playing Patriots games as well as a terrace that overlooks the stadium. In addition, the Hall at Patriot Place is a museum displaying the history of the Patriots, with an official Patriots Pro Shop on the first floor.

Although new stadium developments often come with retail space, condos, or mixed-use facilities as part of the design, Patriot Place is the first such development to potentially blur the lines between the NFL brand, its Trust Agreement, and another non-football-related private enterprise. This blurring of the lines is primarily due to its name, which clearly trades off of the brand and goodwill of the New England Patriots. Because the Kraft Group is not using the New England Patriots trademarks per se, it is technically not in violation of the Trust Agreement and to date the issue has not risen, at least publicly, to any significant level of debate between the league and the Kraft Group.[5]

[5] Mall complexes like Patriot Place that arguably trade off of the intellectual property of the NFL (managed under the Trust Agreement) also raise potential issues with respect to the NFL's revenue-sharing agreement with the NFL Players Association. To date, this issue has not been raised publicly.

However, such a debate may occur in the event that more teams start creating non-football enterprises (such as shopping malls) that trade off of a team's intellectual property that is currently held in the NFL Trust agreement. For instance, the Green Bay Packers are currently in the beginning stages of developing a retail and entertainment center adjacent to their stadium that does not directly utilize the Packers logo (e.g., Packers Place) but does trade off of the team's own trademarked phrase "Titletown" (the project is tentatively called the Titletown District) (Walter 2010a). As part of this effort, the Packers have spent over $27 million in the last 5 years to acquire over 28 acres near Lambeau Stadium (Walter 2010b). From one perspective, this ancillary business model could be viewed as a way in which NFL team owners are cleverly skirting around the fringes of the Trust agreement and their teams' intellectual property to generate revenues that do not have to be shared equally with the other teams. On the other hand, and likely more appropriately, one can view this model as nothing more than a resourceful means of leveraging team ownership to build non-football related revenue.

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Part III
Labor Economics of the NFL

Chapter 8
Measuring Productivity of NFL Players

David J. Berri and Brian Burke

Who is better, Tom Brady or Peyton Manning? If you could have Dan Marino or Dan Fouts in their prime, who would you choose? Or how about Joe Namath and Bart Starr?

The question "who is better?" is one that decision-makers in sports—as well as members of the media and fans—have sought to answer since organized team sports leagues were founded in the nineteenth century. For an answer, sports teams began tracking player statistics. This practice first started in baseball in the nineteenth century. If one is so inclined, one can find player statistics (at baseball-reference.com) back to the National Association season of 1871. Although this data has existed for at least 130 years, what it means has not always been very clear. The entire Moneyball issue—where it was found that baseball team's historically undervalued on-base percentage[1]—makes that clear.

A similar problem exists in football. A multitude of statistics is tracked to separate the performance of the individual from the outcomes we observe for the team. We know who won or lost the game. With performance statistics, teams hope to determine which players were responsible for the team's success (or failure).

For player statistics to have value, though, these numbers must be connected to outcomes. The purpose of this essay to review many of the efforts people have made to make this connection. Our discussion will begin with the NFL's quarterback rating, a measure adopted by the NFL in 1973. The discussion of the NFL's measure will then be followed by a discussion of a standard regression model, which builds on the work of Gerrard (2007) and Berri (2007). We will then discuss a number of different approaches to the measurement of performance that move beyond simple regression analysis.

[1] See Lewis (2003) and Hakes and Sauer (2006).

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In the end, we hope to illustrate that much has been done to measure performance in American football. And we also hope to illustrate that much remains to be accomplished.

8.1 The NFL's Quarterback Rating Measure

Any discussion of the measurement of performance in the NFL should begin with the NFL's quarterback rating metric. This number is reported for each quarterback in virtually every NFL broadcast, but how the number is calculated remains a mystery for many. Steve Young, who retired as the all-time leader in single season NFL passer rating,[2] once noted, "I know interceptions kill your rating, but if you asked me to compute it, I'd have no idea."[3]

The Pro Football Hall of Fame says the measure was developed in the early 1970s by a committee that was led by Don Smith, Seymour Siwoff, and Don Weiss.[4] Here is how Don Steinberg described the process by which Smith arrived at the NFL's measure:

> (Smith) was in a plane flying over Kansas when the eureka moment hit. What if "average" performance in each of those four categories would score one point? And record-level performance would score two points. And for playing really poorly, you'd get zero. Simple! There would be a sliding scale in between. With data supplied by Elias Sports Bureau, the league's statistician, Smith determined that the average pass completion rate for the 1970 season was around 50 percent. Equaling that would be good for one point toward a passer's rating total. The record completion rate for a season was just over 70 percent, so from then on anybody hitting at a 70 percent rate would get two points in that category. Completing 30 percent (or less) of your passes would score a big zero.[5]

This "eureka moment" eventually was translated into the quarterback rating system the NFL adopted. And here is a "simple" step-by-step description of this measure.[6]

> First one takes a quarterback's completion percentage, then subtracts 0.3 from this number and divides by 0.2. You then take yards per attempts, subtract 3 and divide by 4. After that, you divide touchdowns per attempt by 0.05. For interceptions per attempt, you start with 0.095, subtract from this number interceptions per attempt, and then divided this result by 0.04. To get the quarterback rating, you add the values created from your first four steps, multiply this sum by 100, and divide the result by 6. Oh, and by the way, the sum from each of your first four steps cannot exceed 2.375 or be less than zero.

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[2] Young posted a 112.8 mark in 1994. Peyton Manning broke this record in 2004 with a 121.1 mark. Tom Brady—in 2007—also exceeded Young's record with a quarterback rating of 117.2. http://www.profootballhof.com/history/story.aspx?story_id=2390.

[3] Steinberg, Don (GQ; October, 2001). http://www.bluedonut.com/qbrating.htm.

[4] http://www.profootballhof.com/history/release.aspx?release_id=1303.

[5] Steinberg, Don (GQ; October, 2001). http://www.bluedonut.com/qbrating.htm.

[6] This was originally reported in Berri et al. (2006).

It does not become any clearer when one considers the mathematical formulation of the NFL's quarterback rating:

$$\left(\frac{\frac{\text{COMP}}{\text{PASSATT}} - 0.3}{0.2} + \frac{\frac{\text{PASSYDS}}{\text{PASSATT}} - 3}{4} + \frac{\frac{\text{PASSTD}}{\text{PASSATT}}}{0.05} + \frac{0.095 - \frac{\text{INT}}{\text{PASSATT}}}{0.04} \right) \cdot \frac{100}{6},$$

where:

COMP = Completions
PASSYDS = Yards passing
PASSTD = Touchdown passes thrown
INT = Interceptions thrown
PASSATT = Passing attempts

The NFL's measure is certainly quite complicated. In fact, Don Weiss argued that the complex nature of the measure might have made it easier for the people in the NFL to accept this metric. As Weiss argued: "It could have been that it was so complicated, people didn't understand it, so they accepted it."[7]

One wonders, though, if one could do better. As Berri (2007) noted: "In addition to being both complex and non-intuitive, the measure also ignores rushing attempts, rushing yards, sacks, yards lost from sacks, and fumbles lost. Furthermore it is not clear that the factors that are included are actually weighted correctly in terms of team outcomes. In sum, this measure is quite complex, clearly incomplete, and of questionable accuracy."

8.2 Measuring Performance in a Complex Invasion Sport

The first alternative we present to the NFL's quarterback rating system employs a technique that has been used in baseball and basketball. In both of these sports, regression analysis has been employed to link outcomes—specifically final season outcomes—to statistics tracked for teams and players.[8] Berri (2007) follows this basic approach for football. Before discussing this work, though, we need to take a step back and discuss how one models performance in a sport such as American football.

[7] Steinberg, Don (GQ; October, 2001). http://www.bluedonut.com/qbrating.htm.

[8] For baseball, see the work of Asher Blass (1992). The work of Blass builds upon earlier work from the SABR (Society for the Advancement of Baseball Research) research. With respect to basketball one is referred to Berri (2008).

American football belongs to a class of sports that Gerrard (2007) refers to as "complex invasion sports." In addition to American football, sports that fit this rubric include soccer, hockey, and basketball. Gerrard describes the nature of these sports as follows:

> Invasion team sports involve a group of players co-operating to move an object (e.g. a ball or puck) to a particular location defended by opponents (e.g. across a line or between goal-posts). There are several dimensions of complexity in invasion team sports. First the range of player actions is much greater and includes tackling to regain possession, moving the ball forward via passing, receiving, running and/or dribbling, and attempting to score by shooting or crossing the line. Second player actions are highly independent. Scoring requires the ball to be moved forward which in turn requires the team to have regained possession. Defensive and offensive plays are interdependent. Third, many player actions are joint actions. For example, more than one player may join together to tackle an opponent in possession in some codes of football. Fourth, invasion games vary in the degree to which there is continuity or segmentation between offensive and defensive plays. Association football (i.e. soccer) is the most complex in this respect with a continuous flow whereas American football is highly segmented with play stopped and players interchanged after turnovers in possession. Finally, linked to the degree of continuity in play, invasion games vary in the extent to which playing roles are specialized. Again soccer is the most complex in this respect with all outfield players required to be highly competent both defensively and offensively. In contrast American football has highly specialized defensive, offensive and kicking units.

The similarity in such sports suggests one can learn how to model one invasion sport by looking at a model from another sport. To illustrate, the structural equations (SE) Gerrard (2007) employed in a model of soccer.

(SE1) League Points = f(Goals Scored, Goals Conceded)
(SE2) Goals Scored = Own Conversion Rate × Own Shots At Goal
(SE3) Goals Conceded = (1 – Own Save-Shot Ratio) × Opposition Shots On Target
(SE4) Own Shots At Goal = f(Own General Play)
(SE5) Opposition Shots On Target = f(Own General Play)

where general play includes number of passes, pass completion rate, crosses, dribbles, tackles won, interceptions, blocks, and clearances.

Source: Gerrard (2007)

Gerrard begins with the most obvious relationship: Wins are a function of goals scored and goals conceded. He then moves on to add additional relationships until all the data collected for soccer players is noted. It is important to emphasize that Gerrard does not advocate putting all these factors into a single equation. The Gerrard approach[9] is to employ multiple equations to measure the impact of the player statistics tracked by the league.

The process of applying this approach to the NFL begins with the most obvious relationship. Wins in the NFL are clearly a function of points scored and points surrendered. As Table 8.1 illustrates, 84% of a team's wins[10] are explained by how many points a team scores and surrenders in a season.

[9] Berri (2008) employed a very similar approach in the measurement of player productivity in the NBA.

[10] In the event of a tie, a team's wins were increased by 0.5.

Table 8.1 Modeling wins in the NFL-dependent variable: team wins years: 1998–2010

Variable	Label	Coefficient	t-Statistic
Points scored	OPTS[a]	0.264	25.561
Points surrendered	DPTS[a]	–0.294	–22.732
Adjusted R-squared	0.84		
Observations	411		

Notes: team and year fixed effects were employed. The data utilized to estimate this model came from various issues of the *Official National Football League Record and Fact Book*, *Profootball-Reference-com*, and *NFL.com*

[a] Denotes significance at the 1% level

With this relationship in hand, we then move on to models of both points scored by a team's offense and points surrendered by a team's defense.[11] And we begin with the former.

To model offensive points (OFFPTS) we have to first calculate how many points were scored by a team's offense.[12] This calculation is summarized by (8.1).

$$\text{OFFPTS} = 6 * \text{RUSHTD} + 6 * \text{PASSTD} + n * \text{XP} + 3 * \text{FGM} \tag{8.1}$$

where:

OFFPTS = points scored by a team's offense
RUSHTD = rushing touchdowns scored
PASSTD = passing touchdowns scored
XP = extra points
FGM = field goals made

The NFL does not record how many extra points are derived from offensive touchdowns and how many come from touchdowns generated by a team's special teams or defense. To ascertain the value of (n)—or the percentage of extra points a team scores from its offensive touchdowns—one can look at the percentage of touchdowns scored by the team's offense and simply assume that this percentage represents the percentage of extra points scored by the team's offense.

With OFFPTS calculated, we can now review the list of explanatory variables employed in Berri (2007). These variables can be divided into the four categories reported in Table 8.2.[13]

As one can see, a team's scoring begins with the team acquiring the ball. Once the team has the ball, it then must move the ball across the field of play. Obviously, this effort is aided by the team's ability to maintain possession. Finally, possessions must be turned into points. All of this is captured in (8.2), which not only reports the variables employed but also the hypothesized sign.

[11] These models follow from Berri (2007). As noted, these models have been estimated with data from 1998 to 2010.

[12] Teams can also score on defense and special teams. Equation (8.1) is designed to isolate the points generated by a team's offense.

[13] For more information on these variables one can see Berri (2007). Of the variables listed, only Failed fourth down conversion was added for this study.

Table 8.2 Factors impacting a team's offensive ability

Actions	Variables tabulated
Acquisition of the ball	Opponent's kick-offs (DKO)
	Opponent's punts (DPUNTS)
	Opponent's missed field goals (DFGMISS)
	Opponent's interceptions (DINT)
	Opponent's fumbles lost (DFUMLST)
	Opponent's failed fourth down conversion (D4THFAIL)
Moving the ball	Average starting position of drives (START)
	Total offensive yards gained = OFFYDS = RUSHYDS + PASSYDS
	Total rushing yards gained (RUSHYDS)
	Total passing yards gained (PASSYDS)
	Total penalty yards lost (PENYDS)
	Total penalty yards lost by the opponent (DPENYDS)
Maintaining Possession	PLAYS = RUSHATT + PASSATT + SACKED
	Rushing attempts (RUSHATT)
	Passing attempts (PASSATT)
	Sacks (SACKED)
	Third down conversion rate (3RDCON)
	Missed field goals (FGMISS)
	Interceptions (INT)
	Fumbles lost (FUMLOST)
	Failed fourth down conversion (4THFAIL)
Scoring	Touchdown rate = TDRATE = OFFTD/(OFFTD + FGMADE)
	Touchdowns scored by a team's offense (OFFTD)
	Field goals made (FGMADE)

$$\begin{aligned}
\text{OFFPTS} = \; & a_{ik} + \underset{(+)}{a_1 * \text{DKO}} + \underset{(+)}{a_2 * \text{DPUNTS}} + \underset{(+)}{a_3 * \text{DFGMISS}} + \underset{(+)}{a_4 * \text{DINT}} + \\
& \underset{(+)}{a_5 * \text{DFUMLST}} + \underset{(+)}{a_6 * \text{D4THFAIL}} + \underset{(+)}{a_7 * \text{START}} + \underset{(+)}{a_8 * \text{OFFYDS}} + \\
& \underset{(-)}{a_9 * \text{PENYDS}} + \underset{(+)}{a_{10} * \text{DPENYDS}} + \underset{(-)}{a_{11} * \text{PLAYS}} + \underset{(+)}{a_{12} * \text{3RDCON}} + \\
& \underset{(-)}{a_{13} * \text{FGMISS}} + \underset{(-)}{a_{14} * \text{INT}} + \underset{(-)}{a_{15} * \text{FUMLST}} + \underset{(-)}{a_{16} * \text{4THFAIL}} + \underset{(+)}{a_{17} * \text{TDRATE}}
\end{aligned} \tag{8.2}$$

The estimation of (8.2) is reported in Table 8.3, which reveals that these factors explain 93% of the variation in OFFPTS. Furthermore, except for opponent's missed field goals, each independent variable is significant at the 10% level or better and of the hypothesized sign.

Of course, offense is only half the game. And what happens on offense impacts the other half of the game, or the team's defense.

To model DEFPTS—or points scored by the opponent's offense—Berri (2007) simply reverses each of the independent variables listed in (8.2). In other words, where a team acquires the ball from the opponent's kick-offs, punts, missed field

Table 8.3 Modeling offensive scoring-dependent variable: offensive points scored (OFFPTS); years: 1998–2010

Variable	Label	Coefficient	t-Statistic
Opponent's kick-offs	DKO[a]	1.032	4.590
Opponent's punts	DPUNTS[b]	0.378	2.184
Opponent's missed field goals	DFGMISS	0.390	0.799
Opponent's interceptions thrown	DINT[a]	1.137	5.844
Opponent's fumbles lost	DFUMLST[a]	0.929	2.885
Opponent's failed 4th down conversion	D4THFAIL[a]	0.950	3.449
Average starting position of drives	START[a]	9.100	11.737
Yards gained, offense	OFFYARDS[a]	0.074	28.525
Penalty yards	PENYDS[c]	–0.018	–1.944
Opponent's penalty yards	DPENYDS[a]	0.063	8.374
Plays	PLAYS[b]	–0.106	–2.374
Third down conversion rate	3RDCON[a]	1.733	5.622
Field goals missed	FGMISS[a]	–3.370	–11.990
Interceptions thrown	INT[a]	–1.126	–6.296
Fumbles lost	FUMLST[a]	–1.194	–6.619
Failed 4th down conversion	4THFAIL[a]	–2.427	–9.333
Percentage of scores that are touchdowns	TDRATE[a]	102.831	4.559
Adjusted R-squared	0.93		
Observations	411		

Notes: team and year fixed effects were employed. The data utilized to estimate this model came from various issues of the *Official National Football League Record and Fact Book*, *Profootball-Reference-com*, and *NFL.com*. START was taken from *Football Outsiders.com*

[a]Denotes significance at the 1% level

[b]Denotes significance at the 5% level

[c]Denotes significance at the 10% level

goals, interceptions, lost fumbles, and failures on fourth down, the opponent acquires the ball from the same list of factors tabulated for the team. This process of reversing the factors is illustrated with (8.3).

$$\begin{aligned}\text{DEFPTS} = \; & b_{ik} + \underset{(+)}{b_1\text{*KO}} + \underset{(+)}{b_2\text{*PUNTS}} + \underset{(+)}{b_3\text{*FGMISS}} + \underset{(+)}{b_4\text{*INT}} + \underset{(+)}{b_5\text{* FUMLST}} + \\ & \underset{(+)}{b_6\text{*4THFAIL}} + \underset{(+)}{b_7\text{*DSTART}} + \underset{(+)}{b_8\text{*DEFYDS}} + \underset{(-)}{b_9\text{*DPENYDS}} + \\ & \underset{(+)}{b_{10}\text{*PENYDS}} + \underset{(-)}{b_{11}\text{*DPLAYS}} + \underset{(-)}{b_{12}\text{*D3RDCON}} + \underset{(+)}{b_{13}\text{*DFGMISS}} + \\ & \underset{(-)}{b_{14}\text{*DINT}} + \underset{(-)}{b_{15}\text{*DFUMLST}} + \underset{(-)}{b_{16}\text{*D4THFAIL}} + \underset{(+)}{b_{17}\text{*DTDRATE}}\end{aligned} \tag{8.3}$$

The estimation of (8.3) is reported in Table 8.4. As one can see, 91% of the variation in the scoring by the opponent's offense can be explained by the independent variables employed. And each of the estimated coefficients is statistically significant at the 1% level.

Table 8.4 Modeling opponent's scoring-dependent variable: opponent's offensive points scored (DEFPTS) years: 1998–2010

Variable	Label	Coefficient	t-Statistic
Kick-offs	KO[a]	1.244	6.767
Punts	PUNTS[a]	0.663	5.450
Missed field goals	FGMISS[a]	0.633	2.863
Interceptions thrown	INT[a]	1.154	5.780
Fumbles lost	FUMLST[a]	1.146	4.043
Failed 4th down conversion	4THFAIL[a]	1.061	2.876
Opponent's average starting position of drives	DSTART[a]	9.061	12.581
Opponent's yards gained, offense	DOFFYARDS[a]	0.073	37.360
Opponent's penalty yards	DPENYDS[a]	−0.023	−3.163
Penalty yards	PENYDS[a]	0.044	9.406
Opponent's plays	DPLAYS[a]	−0.082	−3.248
Opponent's third down conversion rate	D3RDCON[a]	1.265	3.239
Opponent's field goals missed	DFGMISS[a]	−3.418	−9.518
Opponent's interceptions thrown	DINT[a]	−1.608	−7.650
Opponent's fumbles lost	DFUMLST[a]	−1.536	−5.543
Opponent's failed 4th down conversion	D4THFAIL[a]	−2.608	−13.023
Opponent's percentage of scores that are touchdowns	DTDRATE[a]	116.202	9.660
Adjusted R-squared	0.91		
Observations	411		

Notes: team and year fixed effects were employed
The data utilized to estimate this model came from various issues of the *Official National Football League Record and Fact Book*, *Profootball-Reference-com*, and *NFL.com*. DSTART was taken from *Football Outsiders.com*
[a]Denotes significance at the 1% level

Now that we have models of offense and defense, we can now illustrate how this information can be used to evaluate individuals. And to contrast this work with the NFL's quarterback rating, the individual we will analyze is the quarterbacks.

The statistics tabulated for quarterbacks include yards (via the pass, running plays, and times sacked), plays (passing attempts, rushing attempts, and sacks), and turnovers (interceptions and fumbles lost). Each of these factors has been connected to points scored and/or points surrendered. For example, from Table 8.3 we learn that each yard increases OFFPTS by 0.074 while each play costs a team −0.106 points. For turnovers we need to look at both OFFPTS and DEFPTS. Table 8.3 reports that each interception costs a team 1.126 OFPTS. From Table 8.4 we see this interception increases the DEFPTS by 1.154. So the net impact of an interception thrown is 2.28 points. Similar analysis for a fumble lost reveals a similar result (i.e., a fumble lost cost a team 2.34 net point).

These numbers are reported in Table 8.5. This table also reports—via what we learned about the impact of points on wins reported in Table 8.1—the impact of

Table 8.5 Marginal value of various quarterback statistics

Variable	Impact on point differential of a one unit increase in	Impact on wins of a one unit increase in
Yards (rushing yards, passing yards, and sack yards)	0.0739	0.0020
Plays (rushing attempts, passing attempts, and sacks)	−0.1063	−0.0028
Interceptions	−2.2793	−0.0636
Fumbles lost	−2.3395	−0.0652

each of these stats on wins. With this information in hand we can estimate how many wins each quarterback created.[14]

Such analysis follows an assumption implicit to the NFL's quarterback rating. Specifically, we assume that the quarterback deserves full credit for each statistic credited to the signal caller. As we will see, this assumption for football is quite problematic. Certainly a quarterback's performance depends on the players around him on offense, the defense he faces, and the plays called for him by the head coach. If we ignore this issue for a moment, though, we can use what we have learned so far to estimate each quarterback's Wins Produced per 100 plays (WP100).

8.3 Alternatives to the Linear Regression Approach

WP100 is certainly a reasonable alternative to the NFL's QB rating. But it is not the only measure one can employ in the study of quarterbacks in the NFL. And regression analysis is not the only approach one can take to the study of any player's value in professional football. What follows is a brief review of some alternatives.[15]

8.3.1 Expected Points

Alternatives to the regression approach have their roots in a 1971 technical note published by Virgil Carter and Robert Machol simply titled *Operations Research in Football*. At the time, Carter was an active quarterback for the Cincinnati Bengals while Machol was a well-known innovator in the new fields systems engineering

[14] We can also simplify these numbers with a measure Berri (2007) and Berri et al. (2006) labeled QB Score. Given these results—which differ somewhat from the results reported in Berri (2007)—the QB Score metric would be calculated as follows: QB Score = All Yards—2*All Plays—30*All Turnovers.

If we look at a sample of quarterbacks with a minimum of 224 pass attempts in a season—or the number of attempts in an NFL season needed to qualify for the NFL's quarterback rating leaders—from 1998 to 2010 (421 observations) we see a 0.9997 correlation between QB Score per play and Wins per 100 plays.

[15] Each of these alternatives has been discussed in detail by Brian Burke at Advanced NFL Statistics.

and operations research. Together—using data from the first 56 games of the 1969 NFL season—they estimated the expected point (EP) values of a first down according to field position. With the limited data and computing power available, the authors estimated the point values for swaths of ten-yard segments of the field. The EP values were found by averaging the ultimate scoring outcomes of each possession. Carter and Machol later refined their calculations in 1978 in a paper titled *Optimal Strategies on Fourth Down.*

In the Carroll, Palmer and Thorn (1988) book *The Hidden Game of Football*, authors Bob Carroll, Pete Palmer, and John Thorn constructed their own EP values for first downs at each position on the field. Carroll, Palmer, and Thorn updated the values based on data from the 1986 season. They ignored situations inside 2 minutes for each half of the games, as the drives tend to be truncated by expiration of time.

EP is a tantalizing concept for valuing the performance of players because it can measure the contribution of each play directly in terms of how many points it contributes. For example, consider a situation where a QB snaps the ball on a first down and 10 from his own 30-yard line, worth perhaps 1.1 EP. If he completes a 15-yard pass, his team now has a first and 10 from its own 45-yard line, worth perhaps 1.9 EP. In this case, the QB's play has added 0.8 EP to his team's expected net point differential. If instead he threw an interception, this would give his opponents a first down at midfield. And this is worth perhaps 2.0 EP for the opponent and −2.0 EP for the QB's team. The net value of the play would be negative: $-2.0-1.1=-3.1$. In this case, the interception was equivalent to a loss of 3.1 in net EP differential.

One flaw in the early applications of the concept was the assumption of linearity. The methods of both Carter and Machol, and the authors of *Hidden Game,* planted stakes for the obvious point values at both end zones (seven points and negative two points), and effectively drew a straight line between these two points. Additionally, their estimates used data from throughout the entire game, which would distort the results. Point expectancy can change in the fourth quarter as teams with a lead become conservative and teams that are behind trade overall scoring optimization for urgency.

In Romer 2006, David Romer published a paper titled *Do Firms Maximize?* This paper examined the optimum decisions for fourth down situations in the NFL. His methodology was based on the concept of EP but added a notable consideration. A kickoff following a score has value itself to the receiving team, slightly mitigating the value of the score itself. For example, if receiving a kickoff is worth 0.6 EP, then a field goal is not really three points, but 2.3 EP.

However useful the concept of EP may be for valuing performance, most plays do not result in first downs. Other down and distance situations are far rarer than the first and ten, and their EP values are accordingly more difficult to estimate. In 2009, the website *Advanced NFL Stats* published estimated EP values not only for first down situations but for all common down and distance situations. With this data in hand it became possible to value all scrimmage plays in terms of EP value, not just those that begin and end with first downs.

For example, suppose at any given yard line a pass falls incomplete on first and ten. This play—in terms of the EP estimates offered at Advanced NFL Stats—costs a team about 0.5 EP. Another incomplete pass—giving the team third down and 10—represents a further loss of about 0.5 points. By contrast, if the team gained five yards on first down—giving the team second and five—would place the team in the same EP position as they enjoyed on first and ten (this is consistent with the first down expectancy and success rate methods described below).[16]

EP is particularly useful because the value of yards gained is flexible. The value of a play that generates a three-yard gain on third down and two is much higher than the same three-yard gain on down and ten. By contrast, regression analysis—as described above—gives the same value to every yard.

To implement this concept in the evaluation of a player we refer to Expected Points Added (EPA). Recall the first example situation cited above, where the QB completed a 15-yard pass adding 0.9 EP to his team's net scoring expectancy. We can say his performance yielded 0.9 EPA. One should note that EPA is agnostic as to whether the play was a pass or a QB scramble. It values plays, penalties, and turnovers directly in proportion to the impact they will tend to have on the score of the game. Further, it allows a quarterback—or any other player's performance—to be compared directly with the performance of other facets of his team, such as rushing, kicking, or defense.

8.3.2 Success Rate

Success Rate (SR) is a simple concept in principle, first proposed in *Hidden Game* by Carroll, Palmer, and Thorn. Each play is graded as either a success or failure based on its outcome. For example, if a play gains three yards on third and two, that would be a success. But those same three yards would be a failure if the situation were third and four. Carroll, Palmer, and Thorn devised a simple rule of thumb based on their intuitive sense of football success. A success would be: On first down—a gain of four or more yards; on second down—a gain that at least halved the distance to go; and on third down—a conversion for a new set of downs. The performance of both teams and players can be measured by their rate of success.

At *Advanced NFL Stats*, a method of defining success was offered that might be considered more precise. Using the concept of EPA, successes can be defined more empirically. Specifically, any play that results in a positive change in an offense's net point expectancy can be considered a success.

This technique not only accounts for down and distance considerations, but for field position as well. For example, a play that gains eight yards on third and ten would normally be considered a failure, but if those eight yards put the offense in field

[16] The *Advanced NFL Stats* implementation follows the methodology of the previous efforts and was based on data from all non-preseason NFL games from 2000 to 2008 (the largest and most recent dataset to date). Only first downs in the first and third quarters, and when the score difference was within ten points, were used for the estimates to remove the distorting effect of time and strategic imbalance.

goal range, that might be considered a success (despite not producing a conversion). It also accounts for the effects of the shortened field in the red zone, where it is more difficult to move the ball.

Although not as precise, the simpler rule of thumb defined in *Hidden Game* is very close to the empirically derived benchmarks for success. The exception is that in most situations, teams need five yards on first down (as opposed to four yards) and usually need more than half the distance to go on second down to gain positive EPA.

8.3.3 Win Probability

Each of the methods for measuring the value of football performance described above share the same conspicuous shortcoming. They do not consider the game situation with regard to the effects of time and score. In other words, each method assumes that every game is indefinitely long and the object for each team is to maximize its point differential or first down probability. Alas, this is not how football really works. Take the case of a team trailing by four points late in a game. A touchdown is essential, but a field goal would be pointless. Even on fourth and very long, it wouldn't make sense to purely maximize EP by kicking.

To account for the effects of time and score, we consider the concept of Win Probability (WP). WP is an in-game estimate of the likelihood of each team will win based on the current score, time remaining, and other game variables including down and distance. Win Probability (WP) has been a facet of baseball sabermetrics for many years, measuring the probability one team will win based on score, inning, outs, and runners on base.

The usefulness of WP goes beyond fan curiosity about the home team's chance of winning a game in progress (although that may be interesting in itself). Consider a situation in which a team is down by 3 points with 4 min remaining in the fourth quarter. Their offense faces a fourth down and 2 on the opponent's 31-yard line. Should the head coach go for a first down or attempt a long game-tying field goal? WP should instruct his decision. The break-even success rate for the conversion attempt can be calculated using expected-utility calculations based on WP.

Baseball is a sport well suited to WP estimates because it has a limited number of discrete states. There are 27 outs for each team, 3 bases, and 3 outs per inning, and there is enough historical data to accurately calculate the WP for each state. Football is far more complex, as the states are continuous and non-discrete. For example, compare field position to runners on base. There are only eight possible combinations of base runners in baseball, but there are 99 yard lines on the gridiron. Or compare each baseball team's 27 outs (54 total) in a game to the 3,600 min and second combinations in a 60-min football game. There are over one billion potential combinations of score, field position, down and distance, and time remaining in an NFL football game. Empirically deriving WP estimates is a computational challenge, even with a mountain of data.

There have been several notable efforts at building WP models of football. Carroll, Palmer, and Thorn alluded to the concept in *Hidden Game* and gave some simple examples, but did not construct a full model. William Krasker (2004) created a model based on backward induction. A Monte Carlo-based forward simulation model known as ZEUS was created in 2005 by researchers Frank Frigo and Charles Bower, marketed as a proprietary consulting tool.

Empirical estimation of NFL football can be simplified, thankfully. For example, time remaining can be grouped into minute or 30 second increments. Field position could be grouped in chunks too. Even so, there are still so many combinations of states in a football game that a reliable WP model needs many seasons of data, and even then would require a considerable degree of mathematical smoothing and best-fit estimation.

The WP model implemented by *Advanced NFL Stats* in 2008 (and refined in 2010) applies those techniques to game data from the 2000 to 2009 NFL seasons. The WP for the many various first down states—as a function of score, time remaining, and field position—was estimated using regression techniques. The WP estimates for second, third, and fourth down situations are estimated using Markov model interpolations. Similar to how EPA measures a play's effect on the score, *Win Probability Added* (WPA) measures each play in terms of how much it increased or decreased a team's chances of winning the game.

To illustrate this approach, consider the following scenario: At the start of the second quarter, a team down by 7 points with a second down and 5 from their own 25 will win about 36% of the time. In other words the team has a 0.36 WP. On that second down and 5, say there is a 30-yard pass, setting up a first down and 10 on the opponent's 45. Now that team has gone from a 0.36 to a 0.39 WP, resulting in a WPA for that play of +0.03.

What if the quarterback throws an interception that is returned back to the line of scrimmage? The opponent now has the ball at the 25, giving the trailing team a 0.28 WP. The WPA for the interception would be −0.08.

WPA is very sensitive to the context of the game. That same interception that cost −0.08 WPA when a team was trailing by 7 points in the second quarter would cost much more if the offense was leading by a point late in the fourth quarter. In that scenario, putting your opponent in immediate field goal range would be nearly fatal.

Among WPA's many applications is measuring individual performance. Although we still can't separate an individual player's performance from that of his teammates, summing the total WPA for plays in which individual players took part illuminates who really made the difference when it matters most. It can help identify who is—or at least appears to be—"clutch."

8.3.4 Utility of Metrics

Each of these measures of value is a form of economic utility. As long as winning the game is the ultimate goal of a team or player, the concept of WP provides the ideal utility function for two reasons. First, it is transitive, meaning a greater WP is always preferable to a lesser WP. That may sound tautological, but the same cannot always be said of the other measures. For example, it may be preferable for a team with a late lead to exchange point expectancy for burning seconds off the game clock.

Second, it is linearly proportional. WP is a linear function because a 0.40 probability of winning a game is exactly twice as good as a 0.20 probability. Likewise, a 0.80 WP is exactly twice as good as a 0.40 WP chance. So if a team currently has a 40% WP, it's precisely worth a 50/50 gamble to get to a 60% WP for a success and a 20% WP for a failure. Linearity allows comparisons to be completely proportional, even between players. A QB who has accumulated +2.00 WPA over the course of a season could be said to have played precisely twice as well as one who has accumulated +1.00 WPA. The same linearity applies to EP.

Although WP and WPA can be considered the ultimate utility for football, there remains an important place for other systems such EP, SR, and regression-based models such as Wins Produced.

Statistics such as WPA are tools, and each tool has its own purpose. WPA could be considered more of a narrative statistic rather than a repeatable measure (an observation noted again below). Due to the sensitivity of unique non-repeating situations, compared with EPA or SR, it may not as predictive of future play or representative of the true ability of a player or team. It simply measures the impact of each play toward winning and losing.

Each model sets its focus at a particular resolution of the game. WP sees the game in its entirety, but its resolution at the individual play level can often be poor. A simple three-yard play in the first quarter might barely register as anything larger than a rounding error. A model such as EP can refine the value of that play to a finer resolution. SR can be even more definitive. Each system makes its own trade-off between precision and context-sensitivity. Unfortunately, each of these models requires large datasets of play-by-play information. Regression models based on yards, turnovers, and other box score statistics can provide estimates of value without such requirements.

We should also note that the story told by all these metrics is somewhat similar. To illustrate, we examined each quarterback who attempted at least 224 passes in a single season from 2000 to 2010. In all, we had 355 quarterback observations. Each of these observations was ranked in terms of the NFL quarterback rating, WP100, EPA per play, SR%, and WPA per play. We then summed each ranking to see who the "best" quarterback was across the time period examined. The results are reported in Table 8.6.

Although these five metrics are different, all five ranked Peyton Manning's performance in 2004 as either the best or second best performance by a quarterback from 2000 to 2010. This sample reports the "best" 40 performances. When we look at the QB Rating rankings, of the 40 performances reported, QB Rating ranks 33 as Top 40. Agreement for the WP100, EPA per play, SR%, and WPA per play was 32, 36, 28, and 26, respectively.

We can also look at the correlation between each measure across the entire sample of 355 quarterbacks. As one can see in Table 8.7, WP100 and EPA per play have a 0.93 correlation. Correlations above 0.90 are also seen between QB Rating and WP100, QB Rating and EPA per play, and EPA per play and WPA per play. The weakest correlation is seen when we look at WPA per play and SR%.

Table 8.6 The top 40 quarterback performances: 2000–2010 ranked by various metrics minimum 224 pass attempts season

Quarterback	Year	QB rating	WP100	EPA per play	SR%	WPA per play	Rank QB rating	Rank WP100	Rank EPA per play	Rank SR%	Rank WPA per play	Summation of rankings
Peyton Manning	2004	121.1	1.227	0.380	58.3	1.342	1	1	2	2	1	7
Tom Brady	2007	117.2	1.063	0.400	59.0	1.003	2	4	1	1	5	13
Peyton Manning	2005	104.1	1.006	0.330	56.3	0.847	13	8	4	4	6	35
Philip Rivers	2009	104.4	1.079	0.340	52.9	1.004	10	3	3	16	4	36
Peyton Manning	2006	101.0	1.039	0.320	57.6	1.019	22	5	5	3	3	38
Drew Brees	2009	109.6	1.027	0.280	54.6	0.701	5	6	9	9	18	47
Peyton Manning	2009	99.9	0.984	0.300	54.9	1.032	26	12	6	7	2	53
Daunte Culpepper	2004	110.9	0.976	0.280	53.7	0.736	4	15	10	12	14	55
Kurt Warner	2000	98.3	1.092	0.230	53.0	0.709	30	2	19	13	16	80
Tom Brady	2010	111.0	0.997	0.270	50.5	0.635	3	9	11	49	24	96
Peyton Manning	2007	98.0	0.919	0.290	55.2	0.712	34	36	7	5	15	97
Drew Brees	2004	104.8	0.886	0.290	51.8	0.756	8	48	8	34	9	107
Aaron Rodgers	2010	101.2	0.983	0.220	52.7	0.616	20	13	26	17	32	108
Ben Roethlisberger	2005	98.6	0.930	0.250	51.9	0.696	29	33	14	30	19	125
Chad Pennington	2002	104.2	0.935	0.220	51.7	0.658	11	31	29	36	20	127
Brett Favre	2009	107.2	0.965	0.250	50.8	0.537	6	17	13	46	45	127
Philip Rivers	2008	105.5	0.979	0.240	52.4	0.403	7	14	16	20	77	134
Aaron Rodgers	2009	103.2	0.946	0.230	50.1	0.622	14	26	22	55	27	144
Matt Hasselbeck	2005	98.2	0.895	0.200	53.9	0.639	31	42	43	11	23	150
Chad Pennington	2008	97.4	0.946	0.190	52.3	0.740	39	27	49	22	13	150
Matt Schaub	2009	98.6	0.945	0.200	52.2	0.616	28	28	39	24	31	150
Peyton Manning	2008	95.0	0.893	0.250	51.8	0.786	54	44	15	32	8	153
Drew Brees	2008	96.2	0.997	0.260	52.2	0.443	45	10	12	23	65	155
Carson Palmer	2005	101.1	0.869	0.220	52.0	0.621	21	54	31	29	28	163

(continued)

Table 8.6 (continued)

Quarterback	Year	QB rating	WP100	EPA per play	SR%	WPA per play	Rank QB rating	Rank WP100	Rank EPA per play	Rank SR%	Rank WPA per play	Summation of rankings
Daunte Culpepper	2000	98.0	0.864	0.230	51.0	0.747	33	59	24	44	10	170
Peyton Manning	2003	99.0	0.939	0.200	52.1	0.534	27	30	40	27	47	171
Tony Romo	2007	97.4	0.899	0.240	51.8	0.565	40	41	18	31	41	171
Brian Griese	2000	102.9	0.955	0.230	50.2	0.445	15	23	20	52	64	174
Steve McNair	2003	100.4	0.921	0.210	49.3	0.812	24	35	34	74	7	174
Trent Green	2004	95.2	0.916	0.210	52.2	0.635	52	38	35	25	25	175
Kurt Warner	2001	101.4	0.932	0.190	51.2	0.611	19	32	51	42	33	177
David Garrard	2007	102.2	0.919	0.200	52.0	0.491	16	37	41	28	57	179
Ben Roethlisberger	2009	100.5	0.888	0.210	51.8	0.555	23	47	36	33	43	182
Tom Brady	2009	96.2	0.955	0.220	52.5	0.377	47	22	28	19	82	198
Donovan McNabb	2004	104.7	0.958	0.200	49.5	0.439	9	21	37	70	66	203
Philip Rivers	2010	101.8	0.995	0.220	50.1	0.332	17	11	25	54	97	204
Drew Brees	2006	96.2	0.954	0.230	49.7	0.529	46	24	21	65	49	205
Brett Favre	2004	92.4	0.902	0.230	50.7	0.629	74	40	23	47	26	210
Ben Roethlisberger	2004	98.1	0.808	0.220	51.8	0.556	32	75	32	35	42	216
Ben Roethlisberger	2010	97.0	0.959	0.240	49.0	0.411	42	19	17	82	74	234

Table 8.7 Correlation between various measures

	QB rating	WP100	EPA per play	SR%
WP100	0.91			
EPA per play	0.91	0.93		
SR%	0.82	0.80	0.87	
WPA per play	0.83	0.86	0.91	0.78

8.4 Consistency of Measures

As one can see, we have a variety of measure that one can use to measure the productivity of a quarterback. Each of these measures is based on a model designed to explain outcomes.

Being able explain current outcomes is only the first step in evaluating player statistics. Decisions in sports are statements about the future. So decision-makers not only need to know if what a player did in the past explains the past; they also need to know if past performance predicts the future. And that means we need to see—as Bradbury (2007) argues—if a performance measure is consistent across time. As Bradbury notes, if the measure is consistent it is probably measuring a skill. If not, one is probably seeing a number that is capturing luck and/or the impact of teammates.[17]

To measure consistency we look at the correlation between performance in year (t) and performance in year (t–1). To illustrate, consider Earned Run Average. This metric has been used to evaluate pitchers for decades. And ERA does an excellent job of explaining current outcomes.[18] But the year-to-year correlation is only 0.37, which means that only 14% of a pitcher's ERA in the current season is explained by what he did in the past.[19] This is because a pitcher's ERA depends upon the performance of his teammates. Change the defenders behind the pitcher and the pitcher's ERA will also change. As a consequence, ERA does not provide the best picture of a pitcher's performance.

[17] Here is how Bradbury explains the importance of consistency: "One method researchers can use for separating skill from luck is to look at repeat performance of players. If performance is a product of skill, then the athlete in question ought to be able to replicate that skill. If other factors, such as random chance or teammate spill-overs are responsible for the performance, then we ought not observe players performing consistently in these areas over time. A common way to gauge the degree of skill contained in a performance metric is to observe its correlation year to year. If metrics for individual players do not vary much from year to year, then it is likely that players have a skill in that area. If there is no correlation, then it is likely that other factors are heavily influencing the metric. In the latter case, even if a particular metric appears to have a powerful influence on the overall performance of the team, its utility as a measure of quality is quite limited" [Bradbury (2008): pp. 48].

[18] From 1996 to 2008, 97% of the variation in a team's runs allowed per game was explained by a team's ERA. Data for this regression was taken from Baseball-Reference.com.

[19] Bradbury (2008), p. 52.

Table 8.8 Performance of a quarterback explained by what the quarterback did the previous season years: 1998–2010

Quarterback statistic	Percentage of current performance explained by performance last season (%)
EP per play[a]	21.0
WPA per play[a]	11.7
Success rate[a]	29.0
WP100	16.9
NFL's QB rating	15.0
Completion percentage	31.1
Passing yards per attempt	22.1
Touchdowns per attempt	10.1
Interceptions per attempt	0.6

Notes: minimum 224 passing attempts in consecutive seasons
Observations: 256
[a]Data for these statistics is only from 2000 to 2010. Number of observations is 213

The issue of explanatory power and consistency must be kept in mind when anyone examines performance statistics in sports. Unfortunately for football, consistency in metrics is difficult to achieve.

For example, consider the metrics reported above as well as the elements that comprise the NFL's QB Rating. Table 8.8 reports for each of these statistics how much of current performance is explained by what the quarterback did last year.

To put these numbers in perspective, more than 60% of what an NBA player does can be explained by what he did last year.[20] And in baseball, Bradbury (2008) reports for statistics like walks per nine innings (for pitchers), on-base percentage, slugging average, and OPS; more than 40% of what a played did this year is explained by last year's performance. And more than 60% of a pitcher's strike-outs per nine innings this season are explained by what he did last year.

Quarterbacks, though, simply do not have this level of consistency. Again, the problem is that statistics credited to a quarterback are often about his teammates, coaches, and defenses the quarterback faces.

This is especially true when we look at turnovers. Interceptions clearly have a big impact on outcomes. But a quarterback's interceptions are not predictable. So a quarterback prone to interceptions one season may not exhibit this behavior in the future.[21]

[20] This result is derived from aggregate box score measures, such as Win Score and NBA Efficiency. When we look at individual stats we can see even more consistency. For example—as Berri and Schmidt (2010) report—more than 80% of a player's rebounds per minute are explained by what he did last season.

[21] Berri (2007) reports a similar story for fumbles lost.

8.5 Moving Beyond the Quarterback

Success Rate, EP, WPA, and Wins Produced can obviously be employed to measure the contribution of a quarterback. And it is relatively straightforward to use these measures to evaluate other offensive skill positions (like running backs and wide receivers). But can we use advanced stats to look at defensive players?

Offensive stats are straightforward, but objective defensive stats are problematic. When a running back picks up a ten-yard gain, although other teammates contributed, that's obviously a good play by the ball carrier. And when a running back stumbles at the line for no gain, that's obviously bad. But looking at the same two plays from the other side of the ball is much trickier. A defender, who makes the best play he can by preventing the runner gaining more than ten yards, would be debited for that ten-yard gain. The other four or five defenders who had a chance to make the play sooner, but didn't, aren't mentioned in the play description and wouldn't be docked for the play.

On the other hand, if a defender reads the play and stuffs the running back at the line, that's certainly to his credit. One approach to a solution is to credit each defender for plays like this, and at the same time ignore the plays that really should count against his teammates.

To do this, plays in which the WPA or EPA is positive for the defense would be credited to the defenders who made the play due to either a tackle, an assisted tackle, a sack, or a pass defense. Plays in which the result is negative for the defense would be ignored. "+WPA" and "+EPA" add up the value of every sack, interception, pass defense, forced fumble or recovery, and every tackle or assist that results in a setback for the offense.

What these stats measure is each defender's "playmaking" performance, which measures only half the story at best. +WPA or +EPA statistics don't account for the pass defender who covers his assigned receiver so well he never has to make a play. It doesn't account for a defensive lineman who holds his ground against the double-team and lets the linebacker make a play. It might reward a gambler, a defender who abandons his responsibility chasing the ball.

The theory behind +WPA and +EPA is a player's individual performance from play to play almost certainly follows a normal distribution. Virtually all aspects of human traits and performance are governed by a bell curve, from height to intelligence to athletic feats. There are many instances when a defender plays near his average level of performance, and there are fewer in which he plays either very well or very poorly. The distribution of an athlete's performance is roughly symmetric with respect to his own mean performance level. Nearly all sports statistics are based in some way on the normal distribution, and each player's performance on individual plays is unlikely to be an exception.

We can see and measure a very large part of a defender's performance using +WPA, but his negative performance cannot be captured because of the difficulty discussed above. We can infer his overall performance, however, by what we can see and measure. Further, there is likely to be a strong correlation between a defender's visible positive impact and his overall net impact. In other words, we should expect better defenders to tend to have both more positive plays and fewer negative plays.

Baseball statistics, which can directly measure +WPA and −WPA, lend support for this theory. Fangraphs.com conveniently breaks out the +WPA, −WPA, and net WPA for each MLB batter. +WPA alone does a very good job of identifying the best hitters in terms of overall WPA.

Over the 2007–2009 MLB seasons, +WPA correlates with net WPA at 0.81, while −WPA correlates with net WPA at only 0.17. In other words, positive performance is the primary driver of overall performance, at least at the elite level. Although baseball is a very different sport, and player contribution can be measured much more precisely, the principles of athletic performance largely remain the same. And if these principles hold for WPA, they would be true for EPA as well.

In NFL football itself, +WPA correlates with overall WPA, at least at the *team level*. Over the 2000–2010 seasons, team +WPA correlates with team overall WPA (correlation of 0.52). This is about what we would expect because −WPA and +WPA are each half of the total WPA.

Although the concepts of +WPA and +EPA only capture half of what we'd like to know, that's 50% more than we would know without them.

8.5.1 Tackle Factor: An Alternative Defensive Metric

Most NFL fans understand that the tackle statistic is not a very good way to measure a defender. Weaker defenses tend to give up longer drives, perversely allowing poorer defenders more opportunities to make tackles. Plus, certain positions get more tackles by the nature of team defense. Middle and inside linebackers will naturally have the most tackles by virtue of their role and where they are at the snap.

The sport of baseball faced similar problems with defensive statistics. Until recent years, fielding skill was measured solely by the Fielding Percentage stat, which is a player's number of put-outs and assists divided by his total of put-outs, assists, and errors. It's basically a player's "non-error rate." This is a flawed way of looking at fielding for many reasons. For instance, a player cannot make an error if he cannot get to the ball.

In 1977 Bill James revolutionized fielding stats with the invention of Range Factor (RF). Suppose that for the major leagues as a whole, the shortstop position typically accounts for 20% of its team's put-outs and assists. Assuming a relatively even distribution of fielding opportunities, a shortstop who creates significantly more than 20% of his team's outs could be considered to have better than average range and skill. And a shortstop who has significantly fewer than 20% could be considered to have below average range and skill.

The same principle can be applied for football defenders. Consider the San Francisco 49ers linebacker Patrick Willis' 2009 season. San Francisco logged a total of 832 tackles in the 2009 regular season, and Willis was given credit for 114, a proportion of 13.7%. Willis is an ILB in a 3–4 defensive scheme, and in 2009 the

ILB position in all the NFL's 3–4 schemes accounted for 21.5% of a team's tackle total. Because there are two ILBs on the field at once, a single ILB could be expected to average half that, or 10.7% of a team's total.

Willis' 13.7% compares very well with his position's expected tackle rate. His ratio of tackle percentage compared to the expected percentage for his position is 13.7/10.7, or 1.23. In other words, Patrick Willis has a "Tackle Factor" of 1.23; he makes 23% more tackles than you'd expect from his position, which tells us a lot about his ability to shed blocks, get to a ball carrier, and make a tackle.

To compare Willis to other players we can follow the same process. Redskins middle linebacker London Fletcher notched 95 of Washington's 804 tackles in 15 games in the 2009 season. Over a full season we could estimate he would have $16/15 \times 95 = 101$ "season-adjusted" tackles. Fletcher's adjusted share of the Redskin's tackles would be 101/804, or 12.6%. The MLB position in a 4–3 defense averages 11.9% of a team's tackles, making Fletcher's Tackle Factor 1.06.

8.5.2 Shortcomings

There are a number of shortcomings with TF. For example, it tells us something very different about defensive backs than for linemen and linebackers. Just like total tackles, a weak pass defense would increase the proportion of tackles in the secondary. It still may tell us something about safeties, however. If a safety is making a very high proportion of his team's tackles it may mean he's a standout in an otherwise weak defense. We could also modify the stat to count only run plays, which might be even more illuminating.

TF penalizes players who are not every-down defenders; however, it could be adjusted on a per-snap basis. It also may need to be adjusted based on how many runs and how many passes each defense sees.

8.6 Concluding Observations

Let us conclude by noting that this lengthy essay only serves as an introduction to various methods that exist. One should note, our survey is not complete. For example, the work at Football Outsiders has not been touched upon.[22] We have also not talked about such positions as the offensive line, kickers, or punters. And finally, we have ignored studies of how statistical information is used by decision-makers to evaluate players on draft day and in determining the salaries paid to veteran players.[23]

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[22] Berri (2007) did touch upon the work of Football Outsiders and noted that the measures for quarterbacks offered by Football Outsiders were (a) highly correlated with WP100 and (b) like the measures discussed here, quite inconsistent over time.

[23] For more on these issues one is referred to Berri and Schmidt (2010).

What we hoped to do, though, is introduce the reader to the variety of approaches that already exist. And hopefully, this work will spur additional interest and work by researchers interested in applying the data generated by professional football to a host of interesting issues and problems.

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Chapter 9
Salary Caps in a Model of Talent Allocation

Anthony C. Krautmann and John L. Solow

Ultimately this is a football league, and the stars of the league are the players and the coaches. That being said, I think that teams do place a great amount of importance on the salary cap specialist-contract negotiator role.

Cliff Stein, Chicago Bears' Director of Player Contracts and cap specialist

One of the central externalities associated with large- vs. small-market teams is the potentially adverse effect of the market allocation of talent on competitive balance. Large-market teams are driven to buy more talent than their small-market counterparts, leading to long-lasting dynasties and perennial losers. Such an adverse effect on game uncertainty is likely to affect fans' interest in the sport (under the Uncertainty of Outcome Hypothesis), and hence reduce league demand (Rottenberg 1956). To promote competitive balance, intervention by the Commissioner's office may be warranted to override the free-market allocation. One competitive balance policy widely believed to have the ability to reallocate talent is a limit on team payrolls, known as a salary cap. While an effective salary cap will result in a deadweight welfare loss, this loss may be deemed worthwhile if the benefits associated with improved competitive balance more than offset the costs associated with the welfare loss.

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Fort and Quirk (1995) look at the salary cap in a two-league competitive equilibrium model. In their analysis, they specify complete parity (i.e., where each team's winning percent is 0.500) as the targeted level of competitive balance, and analyze the impact of the salary cap necessary to achieve this outcome on player salaries, team incentives, and so forth. In this chapter, we show that their results are one specific case of how a salary cap affects market outcomes. In particular, we show that the regulator can choose any allocation of talent between the unconstrained market outcome (with its resulting competitive imbalance) to the complete parity outcome outlined by Fort and Quirk. Furthermore, we find that the conditions which result in complete parity are not unique in the sense that there exist a number of salary caps which would yield this result.

We begin this chapter by presenting data on the salary cap for each team in the NFL from 2003 to 2009. This time horizon spans the last two Collective Bargaining Agreements (CBAs), and includes the effects of a new and very lucrative 2006 broadcast contract which bestowed on each team over $100 million per season.[1] We then develop a theoretical Walrasian model of how a salary cap affects team's talent decisions. In this framework, we show that in order for the salary cap to result in a reallocation of talent from large- to small-market teams, the regulator must set the salary cap below the free-market payroll of the large team. We then generate the Fort and Quirk parity conditions and show that there exist a number of salary caps which will yield this condition. That is, once the cap is set low enough that it is binding across all teams, then any lower cap will also result in parity. Because any such reduction in the cap will simply lower players' income without any improvement in competitive balance, such a draconian policy cannot improve social surplus and would likely result in a conflict between owners and the Players Association.

9.1 The Salary Cap in the NFL

The term "salary cap" is somewhat of a misnomer in that it is actually a cap on a team's entire payroll rather than a cap on the amount that an individual player can be paid (with the notable exception being the NBA). Furthermore, all caps are really "bands," setting both a maximum and minimum amount a team can spend on player talent. Finally, in North American sports leagues, we find two types of salary caps: hard caps and soft caps. A hard cap, like that found in the NFL, is exactly what its title implies—an absolute maximum amount that a team can spend (either over the course of each season, or possibly over the course of a couple of contiguous seasons). A soft cap, like that found in the National Basketball Association (NBA), has numerous exceptions to the limit which allows the team to spend more than its cap.

[1] This 8-year, $23.9 billion contract with five different networks yields each team about $100 million annually—accounting for about one-half of the total revenues of the typical NFL team.

The manner in which a cap is calculated is ultimately determined by the terms of the CBA.[2] In general, a cap is determined by first establishing what types of revenues constitute "designated gross revenues" (DGR). For example, the NFL's recently expired CBA includes the following revenue sources in DGR:

- Gate revenues from all pre-, regular-, and postseason games
- Broadcast and other media revenues
- Some licensing revenues
- Ticket revenue portions applied to luxury boxes and premium seating

The per-team cap is then given by $\text{CAP} = (1/n)[\alpha(\text{DGR} - B)]$, where B is non-salary benefits, n is the number of teams in the league, and α is the players' share of designated revenues.[3] In the NFL, the cap grew from $75 million per team in 2003 to $128 million by 2009.

While the cap in the NFL is generally considered a "hard cap," this designation does have a few exceptions. For example, a team is allowed to exceed its cap allowance in any one season; but if it does, it must make up for this excess in the following season. These excesses often arise from the types of bonuses promised to players. While the "likely-to-be-attained" (LTA) category of bonus payments is counted against that season's salary cap, the "unlikely-to-be-attained" (UTA) category of bonus payments is not. However, those UTA bonuses from the previous season which are in fact attained must then be credited against the subsequent year's salary cap.[4]

Another exception allowed in the NFL involves the types of player expenses which are charged against the team's salary cap in any given season. Due to the fact that player contracts are not guaranteed in the NFL, signing bonuses are necessary to compensate players for the increased risk burden. In terms of the amount charged against the salary cap, the signing bonus is prorated across the term of the player contract. However, if the player is released before the contract has expired, then any outstanding signing bonus payments are charged against the team's salary cap in the season that the player was released.

We begin our survey of the salary cap in the NFL by calculating each team's salary cap payroll. By taking the amount of each player's compensation that is counted against the salary cap (called "cap values"), then summing these cap values across each team's roster, we get an estimate of how much of a team's payroll is charged against its salary cap. (Cap values are reported in *USA Today*'s website http://content.usatoday.com/sports/football/nfl/salaries). For each NFL team from 2003 to 2009, this website includes player-specific salary information, including base salary, signing and other bonuses, and cap values. Again, it is this last category which corresponds to that type of compensation which officially counts toward the salary cap.

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[2] These details are from Article XXIV, Section 4 of *NFL Collective Bargaining Agreement* (*2006–2012*).

[3] In the NFL, the players' share for the recently expired CBA was $\alpha = 59.5\%$.

[4] Actually, the amount of bonuses carried over from year to year is those UTA bonuses that actually were attained the previous year minus the LTA bonuses which were not.

To get the team's cap payroll (CAPPAY), we sum the cap values across all players on the team's roster.[5]

Team cap payrolls for all 32 NFL teams across the 2003–2009 seasons are presented below in Table 9.1. Those teams which exceeded the salary cap in any one season are designated with an asterisk.

To get an idea of whether NFL teams spend their entire cap allowance (i.e., the salary cap is constraining), we define a team's CAPSPACE as the difference between the salary cap (CAP) and its CAPPAY. Note that when CAPSPACE is positive (negative), the team is spending *less* (*more*) than its allowance.

While CAPSPACE is intended to measure the degree to which the salary cap binds, its interpretation is clouded by league rules. A team could optimally chooses to purchase less talent than the limit defined by the salary cap, causing its cap payroll to fall short of the salary cap and resulting in a positive value of CAPSPACE. But a team's CAPSPACE may also be positive if it is forced to pay back for excess spending in the previous season. Sportswriters commonly refer to previous spending charged to this period's cap as the team's "Dead Money." Unfortunately, a team's Dead Money is not publically reported, making it difficult to tell whether a positive value for CAPSPACE corresponds to a nonbinding constraint or simply reflects a payback for excessive spending in the previous period.

Since league rules require a team to pay back any excess spending in the following season, we average CAPSPACE for each team across the following time horizons: 2003–2005, 2006–2009, and 2003–2009. This delineation into the pre- and post-2006 seasons is done to see whether the large increase in revenues associated with the new 2006 national broadcast contract had any effect on team behavior. Figure 9.1 contains a series of graphs showing the average CAPSPACE for each of the 32 NFL teams (team numbers appear in Table 9.1).

Since team-specific values of CAPSPACE were averaged over a number of seasons to account for inter-seasonal excesses and paybacks, a binding salary cap should result in a value of CAPSPACE indistinguishable from zero. Our analysis, however, suggests that despite what owners and the league proclaim, teams rarely spend their entire cap allowance. Across the entire 2003–2009 time horizon, the average CAPSPACE for 30 of the 32 teams was significantly greater than zero.[6] Oddly enough, the Minnesota Vikings (team #18) had an average CAPSPACE of a negative $1 million over the entire 7-year horizon—meaning that they overspent the cap by an average of $1 million per year. While the league can threaten a salary cap violator with penalties or lost draft picks, it appears that the Vikings were gaming the rules by

[5] When it comes to comparing player expenses to the salary cap, it is important to calculate a team's "Cap Payroll" by summing the current-roster players' "Cap Values"—that part of their compensation which is charged to the team's salary cap. While Leeds (2008) concluded that one-third of all NFL teams had payrolls that exceeded the salary cap, this result mischaracterizes team compliance. Leeds compared the salary cap to a team's "Total Payroll"—the total amount paid out by the team in any one season to players—rather than its cap payroll; it is the latter to which the salary cap applies.

[6] Only Minnesota and Philadelphia had insignificant mean values for CAPSPACE; for the other 30 teams, the mean value of CAPSPACE was significantly positive.

Table 9.1 Salary cap payrolls (CAPPAY) for NFL Teams ($ Thousands)

Team #	Team	2003	2004	2005	2006	2007	2008	2009
1	Arizona Cardinals	$65,957	$69,100	$68,354	$1,00,793	$1,03,023	$1,08,532	$1,10,854
2	Atlanta Falcons	$64,607	$71,892	$70,284	$92,290	$82,295	$75,422	$99,273
3	Baltimore Ravens	$67,136	$74,144	$77,360	$96,655	$98,213	$1,04,335	$1,05,064
4	Buffalo Bills	$61,506	$70,860	$78,745	$78,920	$89,733	$1,11,748	$1,03,850
5	Carolina Panthers	$63,384	$68,188	$76,226	$92,618	$97,103	$96,930	$1,12,508
6	Chicago Bears	$69,439	$69,456	$75,248	$97,491	$1,02,379	$1,03,378	$1,20,704
7	Cincinnati Bengals	$66,936	$67,664	$77,394	$98,267	$1,01,264	$96,458	$97,822
8	Cleveland Browns	$58,904	$73,559	$61,453	$89,751	$99,569	$1,16,798[a]	$99,274
9	Dallas Cowboys	$62,881	$69,532	$72,765	$84,847	$88,913	$96,760	$96,152
10	Denver Broncos	$57,268	$63,482	$70,152	$92,703	$83,641	$79,856	$90,342
11	Detroit Lions	$62,617	$66,869	$78,773	$83,021	$88,833	$93,135	$98,993
12	Green Bay Packers	$63,393	$73,973	$68,138	$88,883	$92,390	$99,003	$1,16,838
13	Houston Texans	$63,015	$78,090	$71,095	$89,088	$77,608	$97,674	$1,08,161
14	Indianapolis Colts	$67,833	$62,680	$75,155	$94,150	$83,403	$1,09,785	$1,16,606
15	Jackson. Jaguars	$61,981	$64,059	$77,049	$97,511	$94,521	$1,13,388	$99,370
16	Kansas City Chiefs	$61,279	$77,873	$82,166	$87,564	$84,419	$76,481	$77,532
17	Miami Dolphins	$64,558	$69,846	$73,755	$77,210	$81,415	$82,167	$1,08,885
18	Minnesota Vikings	$73,499	$88,196[a]	$86,742[a]	$95,179	$1,08,509	$1,24,016[a]	$1,27,929
19	NE Patriots	$68,501	$70,363	$75,341	$88,884	$1,00,747	$1,06,030	$1,10,646
20	NO Saints	$59,495	$77,333	$81,375	$78,466	$89,591	$1,01,294	$1,18,676
21	New York Giants	$61,563	$64,331	$74,295	$96,308	$87,547	$97,101	$1,20,848
22	New York Jets	$69,066	$65,333	$72,933	$84,098	$85,221	$1,04,696	$1,17,770
23	Oakland Raiders	$62,091	$64,719	$64,313	$81,870	$84,112	$95,297	$96,975
24	Phil. Eagles	$77,871[a]	$81,021[a]	$74,089	$1,02,391[a]	$97,742	$1,12,871	$1,34,568[a]
25	Pittsburgh Steelers	$69,138	$66,308	$72,524	$91,820	$97,245	$1,08,210	$1,13,643
26	SD Chargers	$56,066	$63,222	$76,561	$96,831	$98,489	$1,09,452	$1,12,736
27	SF 49ers	$63,180	$47,992	$78,760	$78,068	$96,675	$1,04,651	$1,17,370
28	Seattle Seahawks	$74,953	$76,903	$67,003	$89,583	$88,850	$99,976	$1,09,212
29	St. Louis Rams	$70,424	$68,678	$68,709	$90,329	$93,426	$1,05,290	$95,629
30	TB Buccaneers	$69,984	$64,194	$70,810	$81,432	$82,314	$93,656	$94,709
31	Tennessee Titans	$67,640	$70,613	$51,156	$73,389	$88,437	$1,00,816	$1,15,678
32	Wash. Redskins	$55,224	$69,552	$64,038	$82,696	$96,657	$1,04,286	$1,06,200
	SALARY CAP	75,082	$80,582	$85,000	$1,02,000	$1,09,000	$1,16,700	$1,28,000

[a]Indicates that CAPPAY > salary cap

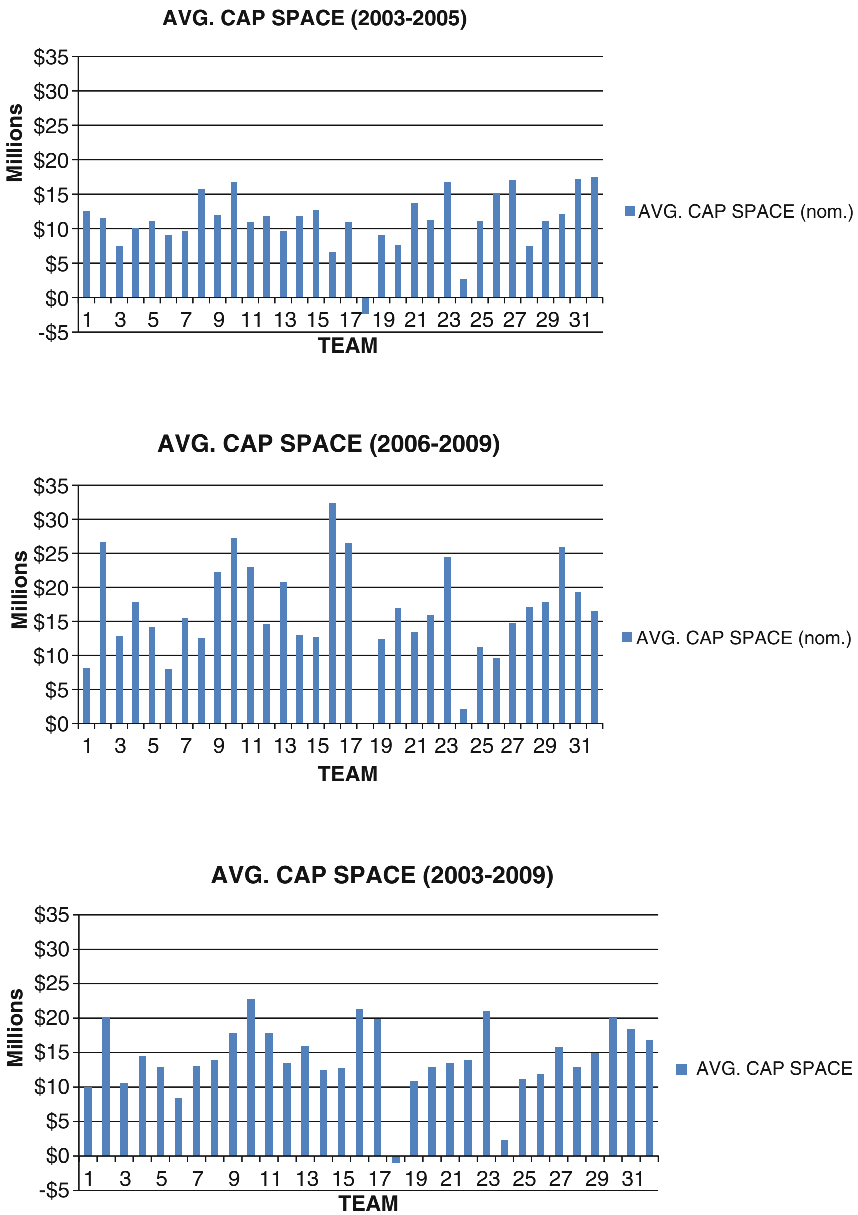

Fig. 9.1 Average cap space for NFL teams

repeatedly over- and under-spending the cap. The Philadelphia Eagles (team #24) also jumped back and forth between over- and under-spending (although their average CAPSPACE was still positive). Finally, it appears that the new lucrative broadcast contract in 2006 had little effect on the spending behavior of teams.[7] Altogether, these facts suggest that a theoretical model of the effects of a salary cap on the allocation of talent should allow for the possibility that the cap is not binding for all teams.

9.2 Model of Salary Cap on the Allocation of Talent

Since a (hard) salary cap restricts the size of a team's payroll, we need a model that determines a team's total payroll. Given its widespread use in explaining the allocation of talent across teams, we begin with a Walrasian fixed-supply model of talent allocation to view how a salary cap affects talent decisions (El-Hodiri and Quirk 1971; Fort and Quirk 1995).[8] In Fig. 9.2 below, we illustrate a modification of the typical Walrasian allocation of talent between a large-market (L) and a small-market (S) team. Here the total supply of talent across the entire league is $\overline{T}$ units, with T^{L} being the amount of talent hired by team L, $T^{S}(=\overline{T}-T^{L})$ being the amount of talent hired by team S, and P_{T} the price of talent. In the absence of an effective cap, the team's unconstrained demand for talent is its Marginal Revenue Product (MRP) function.

In Fig. 9.2, the competitive equilibrium quantities of talent are determined by the condition $MRP^{L}=MRP^{S}$, with the price of talent adjusting to P_{T}^{*}, and teams L and S buying T^{L*} and T^{S*} ($<T^{L*}$) units of talent, respectively. In this unconstrained equilibrium, team L's payroll is $PAY^{L*}=(T^{L*})\cdot(P_{T}^{*})$, and is depicted as the area of the rectangle (abcd). Similarly, team S's payroll, PAY^{S*}, is seen as the area (cdfe). As such, this unconstrained equilibrium is specified as (P_{T}^{*}, T^{L*}, T^{S*}). Furthermore, the total amount paid to players by both teams is given by area (abef). These results yield the standard conclusion that revenue imbalance across teams is the ultimate source of competitive imbalance.

We now turn our attention to an analysis of the impact of a salary cap on this allocation process. Once the regulator sets the salary cap at some level CAP_{k}, the maximum amount of talent that a team is allowed to purchase is given by $T_{k}^{C}=CAP_{k}/P_{T}$. If the cap is set so high that $T_{k}^{C}>T^{j*}$ (thus $PAY^{j*}<CAP_{k}$), then the cap is not binding on team j. If, on the other hand, the cap is set below PAY^{j*}, then the cap is a binding constraint on that team. This is illustrated in Fig. 9.3 for two

[7] The averaged CAPSPACE (in \$2010) of all 32 teams went from about \$13 million in the 2003–2005 era to about \$17 million in the 2006–2009 era.

[8] An alternative model analyzing the allocation of talent, based on a contest-Nash strategy, was recently proposed by Szymanski (2004). This strategic approach is not pursued here because it assumes that each team's share of talent is determined by its share of the aggregate payroll. Since the salary cap potentially constrains the team's payroll budget, a model of talent allocation based upon the relative share of aggregate payroll does not make sense.

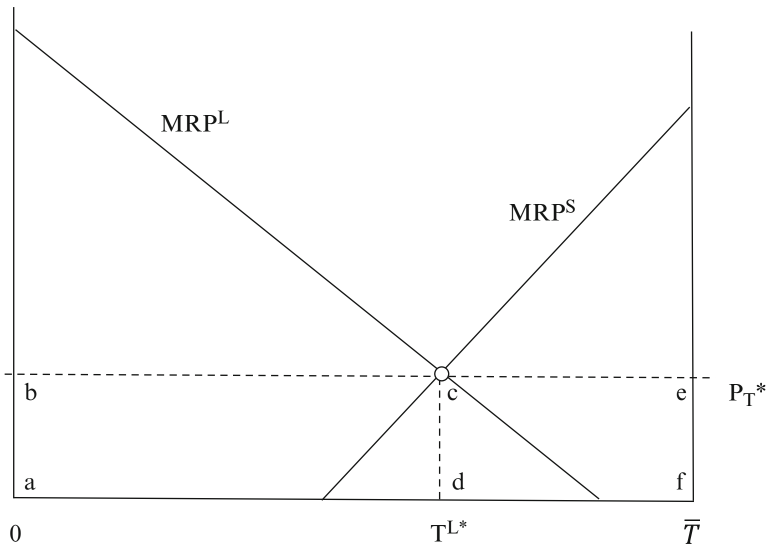

Fig. 9.2 In the unconstrained Walrasian equilibrium, team L buys T^{L*} units of talent and team S purchases $T^{S*}(=\overline{T}-T^{L*})$ units. The market-clearing price of talent is $P_T^{\ *}$

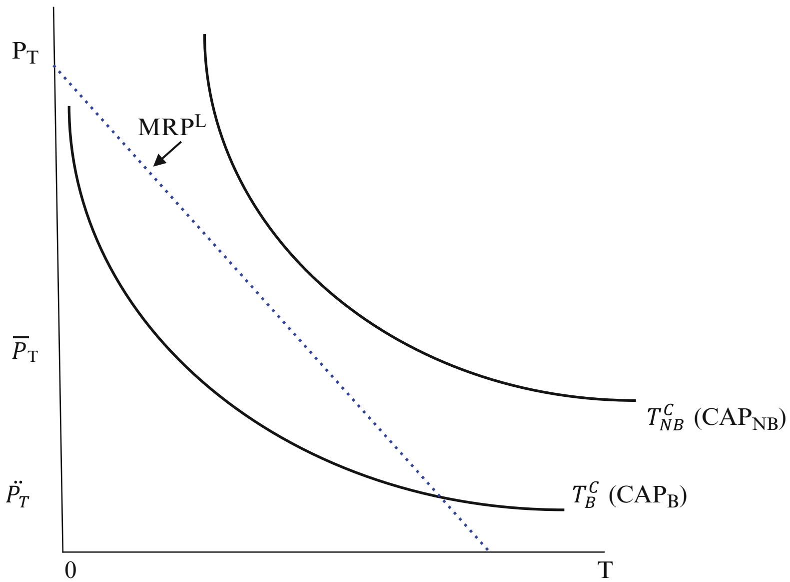

Fig. 9.3 When the price of talent is $\overline{P_T}$ and the salary cap is CAP$_{NB}$, the team buys along its unconstrained demand function, MRP^L—in this case, the cap is "non-binding." When the cap is set at CAP$_B$, however, the constraint is binding on the team at $\overline{P_T}$. In fact, for all $P_T > \ddot{P}_T$, the team buys talent along its constrained demand function T_B^C

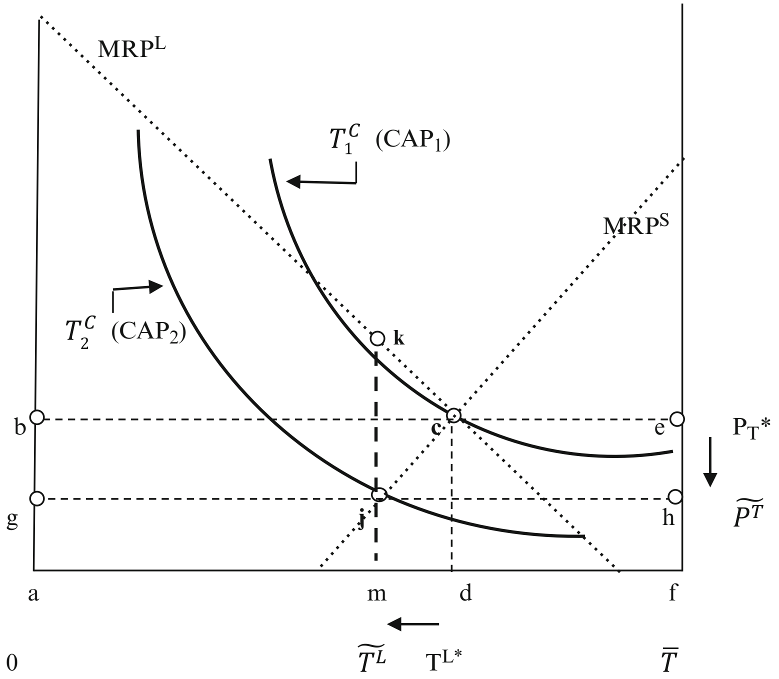

Fig. 9.4 For a salary cap of CAP_1, the constraint just begins to bind on team L. For $CAP_2 < CAP_1$, the team is forced to buy talent along T_2^C. As long as CAP_2 is non-binding on team S, the constrained equilibrium occurs at point j. The price of talent falls and talent is re-allocated from L to S

alternative levels of the cap: CAP_B (a binding constraint) and CAP_{NB} (a nonbinding constraint).

Note that CAP_{NB} is nonbinding on team L in the sense that for any P_T, profit maximization would lead the team to purchase those quantities of talent along its MRP curve (i.e., its unconstrained demand curve). But for CAP_B, the cap is binding on the team (except for very low prices of talent below $\ddot{P}_T$) in the sense that purchases along MRP would be in violation of a salary cap set at CAP_B. When the cap is binding, the team's constrained demand for talent (as a function of P_T) is given by T^C, which is unit elastic throughout its range.

The league is able to affect competitive balance through manipulation of the cap. In Fig. 9.4 below, the economic effects on the allocation of talent are illustrated under two values of the cap. A salary cap of size CAP_1 yields an allocation of talent identical to the unconstrained competitive equilibrium. At point c in Fig. 9.4, $PAY^{L*} = CAP_1$, and the equilibrium (P_T^*, T^{L*}, T^{S*}) is identical to that illustrated in Fig. 9.2.[9] In fact, for all $CAP_k \geq CAP_1$, the salary cap is nonbinding on either team and the allocation of talent is identical to that in the unconstrained equilibrium.

[9] Put differently, CAP_1 in Fig. 9.4 is the level of a salary cap which *just begins to bind* on team L.

Because a team's payroll in the unconstrained competitive equilibrium is observable, the regulator can easily determine the level at which to set the cap in order to make it binding on team L.[10] Any cap value below CAP_1 causes a reallocation of talent from team L to team S. In Fig. 9.4, setting the salary cap at CAP_2 ($<\text{CAP}_1$) forces team L to purchase talent along its constrained demand, T_2^{C}. The price of talent will adjust downward until supply equals demand, determined by the point where T_2^{C} equals MRP^{S} (i.e., point j in Fig. 9.4).[11]

Comparing the two equilibria in Fig. 9.4 demonstrates the following impacts of a binding cap on just team L. First, $\widetilde{T^{\text{L}}} < T^{\text{L*}}$ and $\widetilde{T^{\text{S}}} > T^{\text{S*}}$; that is, a binding salary cap on team L reallocates talent from team L to team S. This is, presumably, the intended result of such a competitive balance policy. Second, the price of talent falls ($\widetilde{P_{\text{T}}} < P_{\text{T}}^{*}$), meaning that players receive lower salaries and that the total payroll falls from (abef) to (aghf). This is a redistribution from players to owners; it is not surprising that players object to the imposition of a salary cap. While the effect on team S's payroll is indeterminate, team L's payroll falls from (abcd) to (agjm). Note also that because $\text{MRP}^{\text{L}} > \text{MRP}^{\text{S}}$ (i.e., points *k* vs. *j* in Fig. 9.4), both teams have an incentive to collude by reallocating talent back toward the competitive solution. That is, the marginal value of a unit of talent is greater to team L than team S; therefore, a sale of talent from S to L (which would put team L over the salary cap) is mutually beneficial to both teams. Finally, this policy results in a deadweight loss, given by the triangle (cjk).

If the regulator lowers the cap further, so that it is binding on all teams ($T^{\text{C}} < \text{MRP}^{j} \forall j$), then the "equalization condition" results.[12] In Fig. 9.5 below, CAP_3 is set so that it is binding on both teams L and S. When the cap is binding on both teams, the price of talent will adjust downward until supply equals demand, which occurs where $\widetilde{T^{\text{L}}} = \widetilde{T^{\text{S}}}$ (point j in Fig. 9.5).

This equilibrium shares a number of characteristics of the previous equilibrium. For example, the salary cap reallocates talent from team L to team S. In fact, the talent levels and payrolls are equalized (i.e., $\widetilde{T^{\text{L}}} = \widetilde{T^{\text{S}}}$ and $\widetilde{\text{PAY}}^{\text{L}} = \widetilde{\text{PAY}}^{\text{S}}$). Again, the price of talent falls ($\tilde{P}_{\text{T}} < P_{\text{T}}^{*}$), and total payroll also falls, leading to a redistribution from players to owners. Finally, both teams again have an incentive to collude on the policy (points k vs. j), and a deadweight loss occurs (area jkc).

It is important to note that the size of the salary cap that generates the equalization outcome in Fig. 9.5 is not unique. Figure 9.6 below shows the parity condition under two different values of the salary cap: CAP_4 and CAP_5. In Fort and Quirk (1995), the implied value of the salary cap used in their analysis corresponds to CAP_4—the largest

[10] In Fig. 9.4, point *c* corresponds to the same allocation of talent as in the competitive equilibrium, where team L's payroll is $\text{PAY}^{\text{L*}}$ and is observable by the regulator. Thus, the regulator can easily determine the cap value at which the constraint just begins to bind on team L.

[11] In this case, we assume that CAP_2 in not binding on team S. The case where the cap is binding on both teams is discussed later.

[12] The equalization condition, identified by Fort and Quirk (1995), occurs when all teams purchase the same amount of talent (i.e., $\widetilde{T^{\text{J}}} = (1/n)\overline{T}\,\forall \text{j}$; hence $\widetilde{\text{PAY}}^{\text{j}} = \widetilde{\text{PAY}}^{\text{k}}\,\forall \text{j,k}$).

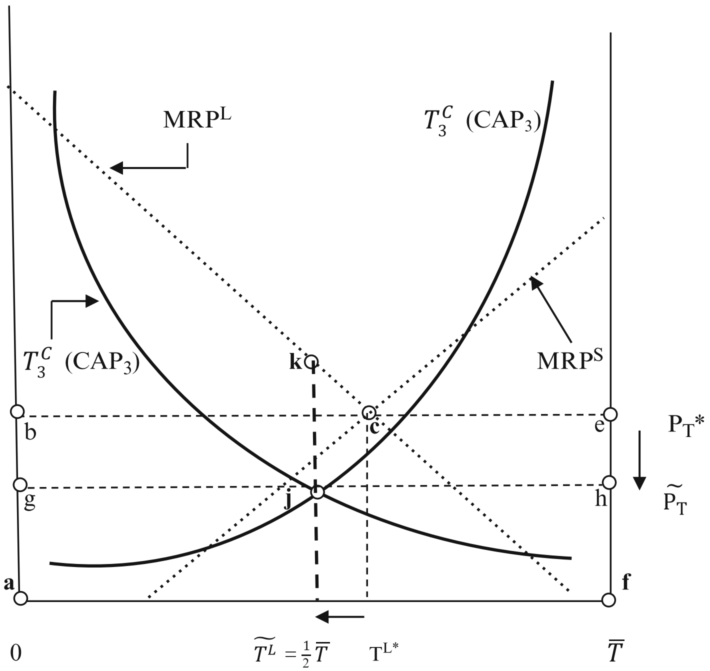

Fig. 9.5 If the salary cap is set low enough that it is binding on all teams, then all teams will be forced to buy talent along their constrained demand functions. The price adjusts so as to clear the market at $\widetilde{T}^L = \widetilde{T}^S$ (at point j above). Since the two constrained demands are symmetric, the allocation of talent is equalized across teams

value of the cap which generates the equalization outcome.[13] But for a salary cap such as CAP_5 ($<CAP_4$), the same equalization of talent occurs. The only difference between these two equilibria is that CAP_5 corresponds to a lower price of talent (i.e., $\dddot{P}_T < \ddot{P}_T$), and hence a lower total payroll (area aghf vs. amnf). Such a result corresponds to an even further redistribution from players to owners.

Omitted from the welfare analysis so far are the effects on fans who may get additional benefits from a more balanced competition. In terms of overall welfare, it is possible for a salary cap to increase social surplus in a Kaldor-Hicks sense. Social surplus increases if the benefits to fans associated with the improvement in competitive balance arising from the salary cap more than offsets the cost to players and owners associated with the deadweight loss. As such, a change from the competitive allocation to that associated with a cap of size CAP_4 might result in an increase in social surplus. But a reduction in the cap below CAP_4 could not further increase social surplus as such a reduction would result in an even larger deadweight loss *without any improvement in competitive balance*. While many cap values can generate the equalization condition, CAP_4 is the largest value of the cap consistent with

[13] Notice that CAP_4 is just small enough to make T_4^C tangent to MRP^S. Although Fort and Quirk implied this value of the cap, they did not explicitly identify it.

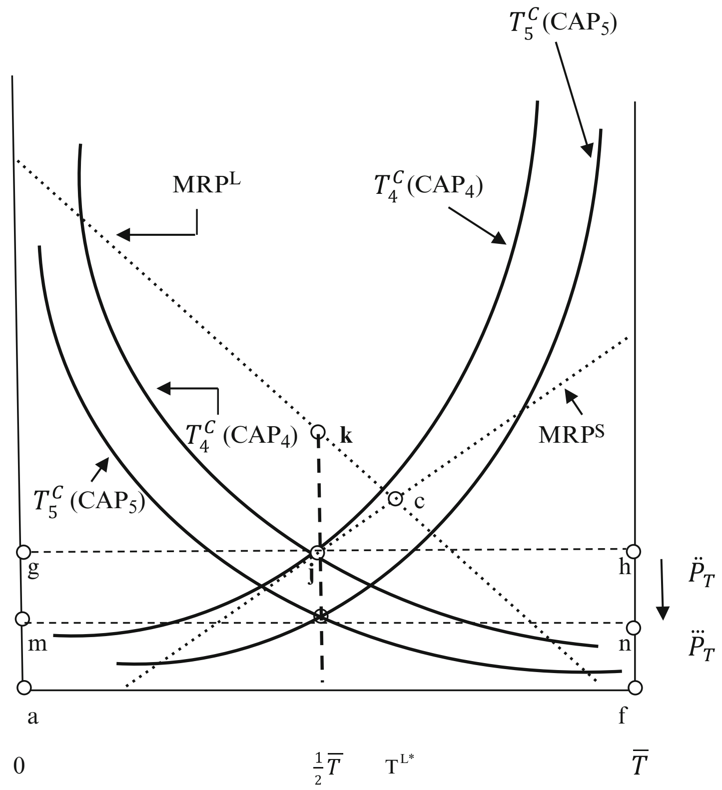

Fig. 9.6 There are many values of the salary cap which are binding on all teams, thus generating the equalization condition. A cap of size CAP$_4$ is the largest value of the cap that results in complete parity. A lower value of the cap (like CAP$_5$) also result in parity, but at a lower total payroll to players

complete parity. In spite of the inefficiency of such a choice, owners may still attempt to lower the cap if it continues to redistribute income to them. As such, we would expect such a strategy to result in a growing conflict between players and owners over league rents.

9.3 Conclusion

While it is widely accepted that a salary cap can affect the allocation of talent in a sports league, little analysis beyond that proposed in Fort and Quirk (1995) appears in the literature. One important conclusion of this paper is that the regulator can choose any level of competitive balance between the free-market allocation (Fig. 9.2) and complete parity (Figs. 9.5 and 9.6).

In order for a salary cap to reallocate talent from team L to team S, the cap must be set at a level such that team L's constrained demand, T^C, is less than its unconstrained demand, MRP^L. Regardless of whether the cap is binding on some or all teams, salary caps depress salaries, forcing players to bear some of the burden of this policy. This helps explain why the players' union has been such an adamant opponent of salary caps. Furthermore, given that a binding salary cap results in $MRP^L > MRP^S$, teams have an incentive to cheat on the salary cap rules. This suggests that a binding salary cap will ultimately necessitate the need for the league to monitor the behavior of teams. Finally, such a policy ultimately results in a deadweight loss. Whether the resulting improvement in competitive balance benefits fans more than outweighs the deadweight loss is an interesting empirical question that suggests the need for further investigation (see Fort and Quirk 2010).

It is natural to ask whether the salary cap binds on some, or all, NFL teams. Unfortunately this seemingly simple question is impossible to answer given available data. The difficulty arises from the various exceptions to these cap constraints described in Sect. "Model of Salary Cap on the Allocation of Talent." The effective salary cap for a team is the official salary cap minus these exceptions. But we have no way of measuring these exceptions for all teams across teams. This too remains as a topic for future research.

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Chapter 10
Economics of the NFL Player Entry Draft System*

Joel Maxcy

The National Football League instituted the reverse order draft for entering players (rookies) in 1936. The NFL system is the original version of a player entry draft, and subsequent draft systems developed by North American team sport leagues are based on this model. The draft determines the initial contract assignment for (most) entering players. The entry draft creates a monopsony situation whereby the player may bargain only with one potential employer. Negotiation leverage for entering players is greatly reduced, and theoretically the monopsony (single buyer) model restrains salaries. As with most restrictions limiting labor mobility, the NFL draft was initially promoted as a tool to remedy competitive imbalance, and has since been defended as necessary to maintain competitive balance. Although the effect of the draft on competitive balance is ambiguous at best, the elimination of a competitive labor market and bargaining power for entering players' services accomplishes the league's objective of eliminating bidding competition and quite clearly reduces salaries. Notwithstanding, the very best entering players, the top draft choices, may also possess significant bargaining power. Contract negotiations in these circumstances may reflect a bilateral monopoly outcome where negotiated salaries compare to a competitive market result.

The NFL drafts serves one more economic purpose for the league, in that it identifies and defines the class of potential players who are eligible for employment by an NFL team. Oddly, regardless of a prospective player's potential forte as a football player, the NFL does not permit employment opportunities for all potential players of otherwise legal working age. Instead eligibility for employment by an NFL team is restricted to an "age" minimum based on one's high school class's graduation date. By means of this eligibility rule, labor market competition with the NFL's primary product market competitor, NCAA football, is replaced by an arrangement of cooperation.

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From 1926 to 1990 the eligibility standards required that an NFL player's college eligibility be fully completed; that entering players were 4 years past their high school class's graduation date. Since 1990, the rule allows players that have completed the equivalent of three college seasons, at least two-and one-half years removed from their high school class's graduation date, for entry into the league. The eligibility rules represent an implied arrangement with the NCAA, which greatly reduces the bargaining competition over the primary source of competition for top-level football talent. Players who wish to enter the NFL before their college eligibility is complete must officially declare themselves for the NFL draft, and by doing so they forfeit their remaining NCAA eligibility—returning to college cannot be used as leverage in the negotiation process. The age eligibility requirements also establish NCAA football as the de facto NFL developmental league, and one that requires minimal investment in training by the NFL. In addition to the development of football skills at the college level, a part of the risk associated with the uncertainty about a player's talent and ability is reduced.

The legality of the draft and employment eligibility rules is not without controversy. The bargaining restrictions and eligibility requirements of the draft each represent restraints of trade and have been challenged under antitrust law. Although the draft survived as a league imposed mandate until the 1970s, a decision in favor of a former NFL player's challenge to the draft suggests the practice is not legal outside of a negotiated collective bargaining agreement (CBA) between player unions and the league (Smith v. Pro Football Inc., 1978). A non-statutory legal exemption by and large removes a CBA from antitrust review. The draft is now embedded in the NFL's CBA. Likewise, the eligibility restriction requiring NFL players to be at least 3 years past their high school graduation has been challenged (Clarett v. National Football League 2004). The courts ruled in favor of the NFL on the grounds that the restriction is (implicitly at the time) part of the CBA.

Historical accounts of the NFL draft are well documented. For example, Coenen's (2005) review of the league's early history provides economic insights into the leagues development including an evaluation of the development and early years of the draft. Whittingham (1992) and Williams (2006) are among several others who have also recorded the history of the NFL draft as part of book length works. Analysis of the draft has received limited attention in the economics literature. Entry drafts are given evaluation in books that comprehensively cover the economics of sports leagues, such as Quirk and Fort (1993) and Noll, R.G. (1974). *Government and the sports business*. Brookings Institution. Published journal articles specific to the draft include, Grier and Tollison (1994) who address the draft's effect on competitive balance. Hendricks et al. (2003) consider the issue of hiring, signals of quality, and the uncertainty surrounding future productivity. Conlin and Emerson (2006) evaluate bargaining and the contract negotiations of NFL rookies, and evaluate the likelihood of discrimination in the context of the draft. Bronars (2004) evaluates the monopsony v. bilateral monopoly question. Legal scholars including McCann and Rosen (2006) have discussed eligibility rules. McCormick and McCormick (2006, 2008) and Fisher (1996) have written on the relationship between NCAA and NFL eligibility.

This chapter will proceed as follows. First is an examination of the economic origins of the NFL draft including the history leading to the current institutional structure of the player entry draft system. The next section provides an economic evaluation of the draft including a review of the economic literature on the subject, empirical data, and a discussion of the theoretical modeling issues associated with the draft (e.g., effects on competitive balance, monopsony wages, bilateral bargaining). A section devoted to legal analysis with economic connotations completes the chapter.

10.1 History

At the time of its establishment in 1920 it was necessary that the new professional football league (formally named the National Football League in 1922) carve out a niche between well-established professional baseball and the already very popular amateur version of the same game, college football. At the outset, the professional game was viewed with contempt by the more reputable college football establishment overseen by the National Collegiate Athletic Association (NCAA). Coenen (2005) describes one fundamental conflict between the NFL and NCAA football. Amateur collegiate players could be enticed to draw a paycheck and suit up for a professional team before completing their collegiate eligibility. This practice, in particular, provoked the college football establishment, which sold the strict amateur standards as central to its product.

The fledgling NFL worked to appease its more formidable collegiate rivals. In 1921, the new league's president Joseph Carr proscribed NFL teams from signing players short of completing their college eligibility. The new professional league's *Code of Ethics* explicitly stated "Tampering with players on College teams shall not be tolerated by this league. The same creates much unfavorable sentiment against professional football and is deplored and discouraged by this league." (Coenen 2005). The policy was further clarified after college stars Red Grange and Ernie Nevers entered pro football immediately after playing their last college games in November 1925, and thus before their graduations. At the suggestion of Chicago Bears owner/coach George Halas, the eligibility policy was made to explicitly prohibit teams from acquiring players whose classes had not yet graduated—specifically players were required to be 4 years beyond their high school graduation date (Williams 2006).

Nevertheless, and despite indiscriminate fines as punishment, the illicit practice of hiring college players by NFL clubs continued into the 1930s.[1] Coenen (2005)

[1] Through its first decade the NFL was comprised of many clubs in small and midsized cities. Carr's strategy was to build a league of large market teams and his policies included selective punishment for clubs violating this policy reflected this objective (Coenen 2005).

describes the routine state of affairs throughout this time period whereby dozens of college players suited up for the alma mater on Saturday and then played under an assumed name for pay on Sunday (p. 17). The periodic revelation and scandal surrounding this practice did little to improve the league's reputation. In fact, Halas violated his own rule proposal against signing college players before their eligibility ended when the Bears signed Notre Dame running back Joe Savoldi in 1930 (Williams 2006).

At once, the league struggled to attract the best quality players even from among the ranks of those who had completed their college careers. Both a product and labor market rival of the NFL, the leaders of the college game disparaged the professional game. Coenen (2005) describes the mind-set of the time where, if college player in this era desired to continue in the game after graduation, coaching in the high school and college ranks was regarded as the only worthy vocation. The respected University of Chicago coach Amos Alonzo Stagg threatened to cut all ties with players who turned professional. Notably his charge, and the first winner of the Heisman Trophy, Jay Berwanger, declined an opportunity for an NFL career despite being the league's first pick in the inaugural 1936 draft. Likewise, the University of Michigan's Fielding Yost made a public comment suggesting that by the age of 30 a professional player would be washed up and would be likely to have forgone a legitimate career or profession (p. 16). Concurrently the national press disparaged the NFL as a "rouge league" with players less dedicated and determined than their college counterparts (p. 18). By the 1930s a solution to the struggling league's dilemma was to gain acceptance through appeasing their more dominant rival with a credible agreement to abstain from labor market competition.

Simultaneously the open competition between clubs to recruit and sign entering players led to a competitive market for entering players. Predictably, the most financially thriving clubs made more lucrative offers and dominated the talent market. The case, put forth by Bert Bell the owner of the Philadelphia Eagles, was made that all clubs did not compete on a level playing field in this regard. Bell's idea for a player draft was triggered by his failure to lure a coveted college football star from signing with a more successful rival. In 1934 Bell vigorously competed with the Brooklyn Dodgers for the services of University of Minnesota fullback Stanley Kostka. Bell reportedly matched Brooklyn's initial offer, but Kostka ultimately chose to sign with the Dodgers for $5,000 per season, an inflated amount at a time when star players earned $3,000–4,000 per year (Whittingham 1992). Following another abysmal season for the Eagles, Bell proposed the reverse order draft to his fellow owners after the 1935 season. He recommended that only an equitable player draft could save the league from going out of business. At that time the NFL was dominated by the Chicago Bears, Green Bay Packers, and New York Giants, while the Philadelphia Eagles, Chicago Cardinals, and Pittsburgh Pirates (Steelers since 1941) perennially finished at the bottom of the standings.

Bell's innovation was for the NFL to conduct a formal college draft that would enable the weaker teams to obtain the top college talent, and in that way be more competitive. Bell recommended that at the end of every college football season, the owners pool the names of all eligible seniors. Teams would make selections in inverse order of the standings; the team with the worst record would get the first draft choice and the team winning the NFL title would get the last. League president Carr was opposed to the idea because he did not want bad clubs or small city teams acquiring the best college talent (Coenen 2005, p. 89). However, after a contentious debate, Bell's idea was adopted unanimously by NFL owners to become effective for the 1936 season. The unanimous approval indicates that owners of high revenue clubs saw the wisdom of the draft, if not for the benefits of competitive balance than for control of negotiations and salary containment. Halas and New York Giants owner Tim Mara are said to have embraced the plan (Williams 2006). Coenen (2005) surmises that it was more likely the enthusiasm for the draft had as much to do with holding down salaries as with leveling the playing field.

On February 8, 1936, the owners of the nine NFL teams met at the Ritz-Carlton Hotel in Philadelphia for the first NFL draft, with those to be selected chosen from a list of 90 players, whose college eligibility was complete. The names were substantially drawn from various All-American and All-Conference teams selected after the 1935 season. Team owners made choices from the list, and nine rounds were needed to allocate the players among the teams (Williams 2006).

The first draft did not prove to be a success neither in terms of public relations—the only media coverage was a three-paragraph mention buried in the *New York Times* sports section several days after the event (Williams 2006). Nor, did the draft help in improving the quality of rosters by attracting college stars to the league. Few drafted players actually signed contracts. Bell, signed none of his nine draft picks, and dealt Berwanger to the Bears, who also could not sign him. Citing the low pay of a football career, Berwanger never played a down in the NFL. Only 31 of the 81 players selected in the 1936 draft were lured to play in the NFL (Williams 2006, p. 42).

Nonetheless the institution has remained in place, but with various modifications ever since then. Williams (2006) provides details of the early draft years. In 1937, with the addition of the Cleveland Rams, the draft increased from nine rounds to ten and continued to expand until it reached 30 rounds in 1943. The expansion of rounds paralleled World War II, on the assumption being that many of those drafted by the league also would be drafted by the Armed Forces.[2] From 1938 to 1948, the NFL allowed only teams with the five worst records to draft in the second and fourth rounds. In the early years it was common for a team to trade an established player for the rights to sign a draftee, who had been selected with the team in mind. Teams initially were allowed to trade actual draft positions for players, as is done today. However in 1940, a new rule prohibited the sale or trade of a team's first two draft positions until one playing season after that selection. The rule was expanded to include all rounds and remained in effect until 1947, when the Chicago Bears received two draft choices in trades from the Chicago Cardinals and Philadelphia Eagles. A peculiar adaptation was the bonus selection, in place from 1947 to 1958.

[2] During the war, the NFL voted to stop using the term "draft" and referred to players as being on the "preferred negotiations list" (Campbell 1985).

Table 10.1 Historical accounts of the NFL draft

League	Years	Rounds	Teams	Total players drafted
NFL	2002–2010	7	32	255–261[a]
NFL	1999–2011	7	31	246–254[a]
NFL	1995–1998	7	30	240–249[a]
NFL	1994	7	28	222[a]
NFL	1993	8	28	224
NFL	1977–1992	12	28	336
NFL	1976	17	28	487[a]
NFL	1970–1975	17	26	442
NFL/AFL	1969	17	26	442
NFL/AFL	1968	17	26	462[a]
NFL/AFL	1967	17	25	445[a]
NFL	1966	20	15	305
NFL	1961–1965	20	14	280
NFL	1960	20	13	240
NFL	1952–1959	30	12	360
NFL	1951	30	12	361
NFL	1950	30	13	391
NFL	1949	25	10	251
NFL	1944–1948	32	10	300–330
NFL	1943	32	8	300[a]
NFL	1939–1942	22	10	200–204[b]
NFL	1938	10	12	110[b]
NFL	1937	10	10	100
NFL	1936	9	9	81

[a] Total exceeds the number of rounds multiplied by the number of teams

[b] Four teams with best records did not draft in the second and fourth rounds

One randomly selected team received an extra pick, a pre-draft choice. Once a team was selected, it was disqualified from these lotteries in future years. The bonus selection included future Hall of Famers Chuck Bednarik, drafted by Philadelphia in 1949, and Paul Hornung, drafted by Green Bay in 1957 (Williams, 2006, p. 42). Table 10.1 provides an historical evolution of the draft including the number of rounds and total players chosen in drafts over its history.

Following WWII, NFL teams continued to struggle to convince many of their draft picks to play in the league. However the draft had effectively stopped the escalation of salaries by restricting players to one potential employer. Competition for players' services increased markedly for the NFL when the rival All-American Football Conference, (AAFC) began in 1946 with eight teams. At that time there were ten NFL teams, and there was a substantial influx of potential players returning from the military service. The competition for talent resulted in an escalation of players' salaries.

The founding of the American Football League (AFL) in 1960 prompted a repeat of the NFL-AAFC labor battles of the late 1940s, only it was more intense and financially volatile. The two leagues competed for the services of the same entering players, and the AFL instituted its own formal draft. A team in the NFL, or the AFL, not only had to draft a player, but it had to keep him from signing with a team in the other league. "Salesmanship, wiliness, and downright chicanery often came into play" (Whittingham 1992). The merger agreement reached by the NFL and AFL in 1966 eliminated the long-running draft shenanigans between the two leagues. From 1967 to 1969, the leagues held a common draft, which was shortened to 17 total rounds. After the official merger of the leagues before the 1970 season, the draft structure remained for the most part stable until 1990. In 1977, the draft was reduced to 12 rounds and was moved from March to late April or May.

The United States Football League (USFL) opened play in 1983 and conducted their season in the spring, as opposed to the traditional fall schedule of the NFL. Like earlier rivals they also competed aggressively for entering talent with the NFL. To gain an advantage the USFL negotiated with players who had not completed their college eligibility. Collegiate stars not eligible for the NFL, including 1982 Heisman Trophy winner Herschel Walker, signed contracts with teams in the new rival league. On the advice of one of the league's particularly imprudent owners, Donald Trump, the USFL, unwisely chose to move to a fall schedule and directly folded in 1986. Yet, the success of their "underage" players in part triggered the NFL's lowering of its eligibility standard to 3 years past high school graduation in 1990. College juniors, at that time, became eligible, but were forced renounce their remaining collegiate football eligibility before applying for the NFL draft. Although the NCAA recommended that players who declared for the draft, but did not sign contracts, be allowed to retain college eligibility, the NFL was adamant that all remaining eligibility be forfeited as they did not want to face "chaotic" situations where unsigned draftees threatened to return to the NCAA (Eskenazi 1990).

In 1993 the landmark CBA, which established the league's salary/payroll cap, also reduced the draft to eight rounds in 1993 and to seven rounds thereafter. The draft system has remained virtually intact from that point forward. In addition, the 1993 CBA introduced the "rookie pool" formally the "Entering Player Pool." The rookie cap is the specific pool of money within each team's salary cap dedicated to the salaries of all entering players. The caps vary by team, and are based on the number and round of each franchise's draft selections so that teams with lower draft choices (earlier in the draft order) can spend more of their total capped payroll allocation on rookie salaries.

Since 1993 the draft itself has become increasingly a public entertainment resource for the league. The event is televised nationally on the cable sports network *ESPN* and held in prime New York locations such as Madison Square Garden and Radio City Music Hall. In addition to the prime location, starting in 2010 the draft was moved from a Saturday/Sunday daytime schedule and televised over 3 days beginning on a Thursday evening, and in prime time for television (Fogg 2010).

10.2 Economic Analysis

In addition to the monopsony affects on negotiations, salaries, and competitive balance issues, a major economic result of the draft is its role in the development of scouting and the analysis of the efficiency of matching its draft choices to a team's talent needs. These issues have been studied and reported in both formal economic analysis and less formally in the press and historical accounts. There are several published studies pertaining to the economics of NFL draft, and the topic is a fertile ground for additional research. Empirical assessments of the draft can be, and have been, employed to test the supposition that the draft improves competitive balance (Coenen 2005; Grier and Tollison 1994). Studies have also evaluated the draft's effectiveness of talent evaluation and tested for discrimination in the section process (Hendricks et al. 2003; Conlin and Emerson 2006). Bronars (2004) compared bargaining under monopsony power and the corresponding suppression of wages to a bilateral monopoly.

Empirical assessment of the draft's effect on salaries for entering players, or for NFL player salaries as a whole, is limited because little actual data is available. The monopsony outcomes can be ferreted out by comparing contracts and salary offers of entering players when rival leagues offered entering players more negotiation options. The reports of salaries and negotiations are mostly anecdotal examples derived from press reports.

Details of the bidding negotiations for the services of All-American half-back Charley Trippi from the University of Georgia provide an example of how the AAFC altered the NFL salary structure. In 1947, when NFL salaries were typically less than $10,000 per season, Dan Topping, owner of both the AAFC New York Yankees the Major League Baseball Yankees, offered Trippi a football/baseball contract. Bill Bidwill, owner of the Chicago Cardinals of the NFL, countered with a 3-year contract that totaled $100,000 for playing football and a tryout with the Chicago Cubs. Although less than the Yankees' offer, Trippi, preferred the already-established NFL and signed with the Cardinals (Barnett and Carroll 1989).

Likewise, when the AFL began in 1960 salaries in the NFL were in the range of $10,000–25,000 per season (Whittingham 1992). The AFL strategy of talent accumulation was to compete for entering players and negotiate aggressively. By 1964, University of Alabama quarterback Joe Namath signed a 3-year contract, totaling $400,000 in compensation, with the AFL's New York Jets. In 1965 Texas Tech University running back Donny Anderson signed 3-year contract with the NFL's Green Bay Packers, totaling $600,000 in compensation (Whittingham 1992). The bidding wars drove salaries to much higher levels and hastened the 1966 merger of the two leagues. Competition for college talent erupted again in the 1980s when the USFL opened play. The new league aggressively bid for top college players and stars such as Herschel Walker, Steve Young, and Jim Kelly signed contracts well in excess of NFL salaries for rookies at the time (Kogan, undated). Since the USFL folded in 1986 the NFL has faced little competition for the services of entering players.

The courts evaluated the monopsony effect of the draft in the lawsuit of the former University of Oregon back James "Wazoo" Smith, drafted in the first round by the Washington Redskins in 1968. Smith signed a contract with the Redskins that eventually paid him a total of $69,800. He was injured in his rookie season and never played in the NFL again. He filed an antitrust suit against the NFL claiming the draft limited the competition for his services and reduced his fair market compensation.

The courts determined that Smith's fair market value was $92,000 less than that which he was paid (Weiler and Roberts 2004, p. 186).[3]

In regard to the draft's effect on competitive balance, theoretically Rottenberg's (1956) invariance principal implies that talent will move to its high-valued user regardless of the initial assignment of property rights; the draft should not affect the distribution of talent. El Hodori and Quirk (1971) and Quirk and Fort (1993) and Fort and Quirk (1995) confirm this assessment as applied to entry draft systems. Drafted talent can be sold or traded to the team that values it the most, and an entry draft theoretically will not alter the distribution of talent across teams. A simple empirical test of the immediate effect of the draft on competitive balance is conducted by Coenen (2005). He argues that his findings show that competitive balance actually worsened immediately following imposition of the draft. Comparing pre-draft records (1933–1935) to post-draft records (1936–1945), he finds the collective winning percentage NFL's four worst teams (Dodgers, Eagles, Cardinals, Steelers) dropped from an average of 0.352 to 0.291 per team. Meanwhile the best teams (Bears, Packers, Giants) continued to dominate the league in the post-draft period (p. 90). Coenen suggests that the most important effect of the draft was to stop the bidding wars and cause a reduction in player salaries. This finding is consistent with the more rigorous tests reported in Table 10.2. Standard deviation of win percent and the standard deviation of point differential per game are reported for the 16 year periods before and after 1936. The measures, the former dispersion of the final standings and the latter reflecting the closeness of contests, also show that competitive balance declines, though the change is not statistically significant, in the years directly after the draft began. The results are consistent when evaluating any equal time period pre- and post-draft.

Grier and Tollison (1994) conversely find that the draft improves competitive balance. Rather than looking at pre- and post-draft comparisons, they evaluate annual changes in team productivity through an era after which the draft had been well established. They conduct an empirical, time-series, assessment of the draft's effect on team success over an 8-year period from 1983 to 1990, and find that draft order is positively correlated with team productivity. Teams with draft picks early in the draft order show greater improvement than those drafting later. The authors conclude that in terms of improving competitive balance the draft clearly matters.

The draft also altered teams' talent procurement procedures. Coenen (2005) submits that the draft advanced the practice of scouting. In order to obtain the best talent, teams with greater resources simply invested more in scouting—thus offsetting the effects of the draft's effect on competitive balance. For example, the Packers increased their scouting budget from $340 to $8,700 between 1935 and 1945 (Coenen 2005, pp. 89–90). The NFL-AFL wars beget the hiring of full-time scouts

[3] Per antitrust law, Smith was awarded treble damages of $2,76,000. The ruling did not open the door to other antitrust challenges to the draft as by the time the appeals process was exhausted in 1978, the draft was established in the CBA and immune from further antitrust scrutiny.

Table 10.2 Competitive balance dispersion measures

Pre-draft years	Stn. Dv. win%	Stn. Dv Pt, Diff.	Post-draft years	Stn. Dv. win%	Stn. Dev Pt, Diff.
1920	0.265	10.529	1936	0.261	9.149
1921	0.246	10.689	1937	0.257	7.848
1922	0.194	7.760	1938	0.214	6.494
1923	0.275	8.437	1939	0.317	10.362
1924	0.261	9.637	1940	0.248	7.455
1925	0.254	8.116	1941	0.299	12.188
1926	0.267	7.766	1942	0.330	13.296
1927	0.301	10.153	1943	0.306	11.314
1928	0.309	10.687	1944	0.344	12.415
1929	0.242	9.251	1945	0.276	10.148
1930	0.253	8.253	1946	0.212	7.110
1931	0.264	5.923	1947	0.196	7.030
1932	0.219	7.334	1948	0.276	13.648
1933	0.274	12.783	1949	0.270	11.857
1934	0.215	7.433	1950	0.245	10.577
1935	0.261	9.149	1951	0.250	8.820
AVERAGE	0.256	8.994		0.269	9.982
t-stat on pre- and post-means	−1.410	−1.460			

and eventually the birth of the scouting combines, where several teams pooled resources to develop a more efficient talent evaluation process. The evolution of player evaluation over the following decades has been significant. Teams began to pool resources in the 1960s and 1970s when as many as three combines were held at once. By 1985 all 28 NFL teams were members of National Football Scouting (NFS) and participated in a single combine. Today the scouting combine is held each January in Indianapolis and NFS collects data on thousands of college football players.

Despite the extensive research, collective information, and expense now involved in searching out and evaluating talent to fill team needs, procurement remains an inexact science. The efficiency of the talent evaluation and matching process is analyzed by (Hendricks et al. 2003). They develop models that generate general labor market hypotheses about the relationship between ex ante hiring patterns and ex postproductivity. Testing their models using NFL data they find that when comparing ex post-performance, to hiring patterns based on team draft choices, players from major colleges are overvalued and drafted earlier than players from less renowned schools. They put forth that this is caused by a combination of risk mitigation and statistical discrimination.

Conlin and Emerson (2006) explicitly test for employment discrimination in the NFL, and they find evidence of racial discrimination in the hiring process when analyzing the draft. They show that draft round determines the initial contract terms and salary for NFL players. They find that black players are systematically selected in lower rounds in relation to statistically comparable white players. Rookie black players from the same draft rounds though are more likely to earn roster spots and start games than whites. However, there is no evidence of discrimination in later career retention and promotion decisions. Like Hendricks et al., they agree that signaling, risk aversion, and statistical discrimination on the part of teams plays a role in these empirical interpretations.

Although the draft offers teams considerable monopsony power over negotiations, highly productive players, or those with that potential, possess market power as well. Bilateral negotiations, in theory, divide rents between the player and the team and perhaps reflect a competitive market outcome. A draft pick, has some negotiation leverage in that he may threaten to withhold his services (holdout) in an attempt to negotiate a more lucrative contract or even force a trade to a preferable team. Most famously, John Elway was able to engineer a trade of his services from the Baltimore/Indianapolis Colts, who had made him the first choice in the 1984 draft, to the Denver Broncos.[4]

Top draft choices may improve their negotiation leverage if they are aware how much the team is willing and able to pay. Team rookie cap amounts are not disclosed to players and their agents, however Mirabile (2007) shows that these values are straightforward for an outsider to estimate. Highly drafted players are often able to negotiate contracts that place them in the upper echelons of league salaries. For example, in 2008 the Atlanta Falcon's Matt Ryan, the league's second draft pick, secured a contract making him the fourth highest paid quarterback in the NFL. An NFL executive, in conversation with this author, explained that teams with poor records and top draft choices face considerable pressure to sign these players, and not risk a holdout, so as to signal to their fans that they are serious about improving. The excessive pay to unproven rookies hampers their efforts toward long-term success. The Detroit Lions were used as an example (McKay 2009). The league views this rookie pay situation as problematic to the degree that significantly greater restrictions on rookie pay are at the crux of the 2011 collective bargaining negotiations.

Bronars (2004) evaluates bilateral bargaining at both the individual player level, including draftees, and the collective bargaining negotiations themselves. Contrary to the view that productive and potentially productive players are able to use their market power to negotiate contract terms that reflect their true value—marginal revenue product (MRP), he shows that star players earn salaries well below their MRP. He finds that the true winners in bilateral collective bargaining negotiations are the lowest paid players, often represented by a significant number of undrafted rookie free agents. These players are beneficiaries of the minimum salary established through the collective bargaining process, and that salary is generally greater than the player's MRP.

[4] Elway had additional leverage in that he was already playing professional baseball and under contract with New York Yankees.

10.3 Legal Analysis

The legal arrangement surrounding the draft and draft eligibility is fundamental to the economic outcomes. These issues are addressed in the written judicial opinions that accompany court decisions and by legal scholars writing law review articles. The draft itself, as reflected in Smith v. Pro Football Inc (1978) described above, is likely a violation of antitrust law outside a CBA, where it is protected by the non-statutory antitrust exemption. The players in North American sports leagues are unionized and, though typically grandfathered in from existing league policy, each of the leagues have draft procedures included in their CBA agreements. Team sport leagues in other parts of the world, such as professional soccer, are rarely unionized and entry drafts are very unusual.

As determined by the Supreme Court of the United States (SCOTUS), regarding a similar NBA policy (*Haywood v. NBA*), age/eligibility restrictions are illegal restraints of trade under antitrust law. Eligibility restrictions within the CBA are more controversial, and perhaps still subject to legal review by the SCOTUS. In 2004 19 year old, Maurice Clarett, 2 years removed from high school graduation challenged the eligibility rule (Clarett v. NFL 2004). The US District Court sided with Clarett, but the decision was overturned on appeal in favor of the league. The SCOTUS declined further review. McCann and Rosen (2006) provide a thorough review of eligibility rules in regard to this case. They argue that eligibility restrictions of this kind represent restraint of trade that should not be immune from antitrust scrutiny even if included in a CBA. Conversely Brooks (2004) lays out the United States Court of Appeals' (Second Circuit) rationale that to open CBA to antitrust review out of concern that such review will damage the parties' incentive to bargain.

Eligibility rules and the relationship between the NFL and NCAA have also drawn much attention from legal scholars. For example, Fisher (1996) offers a critical review of the NCAA regulations that force college players to forfeit amateur status thus eliminating bargaining leverage with the NFL. These include rules that prohibit the athlete's hiring of an agent and his declaration for the NFL draft. Papers by McCormick and McCormick (2006, 2008) are highly critical of NCAA policies regarding student athletes. They put forth that an employment relationship exists between athletes and their schools, and in the case of football the NCAA and NFL are legitimate competitors in the labor market. Given this, all rules that suggest interaction to restrain this market should be subject to judicial review.

10.4 Conclusion

The NFL conceived the institution of the draft for entering players. Its success in achieving owners' objectives was so apparent that other professional team sport leagues have replicated their model. The most prominent effect is cost containment, as the draft greatly limits bargaining leverage for incoming players and significantly restrains salaries. Nonetheless the effect on its most public goal, promoting competitive balance remains empirically ambiguous. Empirical analysis of competitive balance and closeness of contests, contrasting the years just prior to and just after the drafts' institution show perhaps that the draft caused greater imbalance. However, one study of more recent years shows that teams with favorable draft positions are more likely to improve from the prior year. A more oblique function of the draft is that it facilitates distinct labor market segmentation between amateur NCAA football and professional football. In addition to eliminating competition for players the arrangement creates a low cost (to them) developmental league for the NFL.

Though allowed with consent of players' unions through the collective bargaining process, some aspects of the draft remain legally suspect. Eligibility rules in regard to age restrictions and the implicit collusion with the NCAA to divide and restrain the football players' labor market remain controversial. At present, there is no reason to believe the eligibility rules are in danger of being overturned. However, a challenge of this type has yet to be reviewed by the United States Supreme Court.

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Chapter 11
The Market for NFL Coaches and Managers

Keith D. Malone, Jim F. Couch, and J. Douglas Barrett

11.1 Introduction

Everyone in an organization plays a role in the success or lack thereof in achieving stated objectives. Sports are no exception in this regard. Players, coaches, trainers, front offices, owners, and other staff each contribute to the ultimate results, whether they be winning, making money, or both. It is hardly uncommon for debates to ensue across the country regarding which group is ultimately the most responsible for the success or failure of the team. In this chapter, the contribution of coaches is considered.

Interest in the effects of coaching in the NFL is hardly confined to a single group. Sportswriters, fans, academicians, and employers share varying levels of stakeholding, but retain keen curiosity. Sports shows on both television and radio frequently feature spirited discussions with respect to the success of coaches in many sports, notably in the NFL. The issues range from the mundane to the highly controversial, including the possible effects of racial discrimination in the hiring process (see, e.g., Madden 2004, or Malone et al. 2009).

In spite of the obvious interest in coaching efficacy, there is a dearth of research in the area for NFL coaches. More investigation has been performed for Major League Baseball (MLB). A few studies exist for college coaches. Many relevant studies have been undertaken for more general organizational managerial applications. The combination of research from other sports, what has been done for the NFL, and other managerial analyses offer a blueprint and roadmap for future research in the area.

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Prior to delving more deeply into the literature, it is worth noting that there is an interplay between sports economics and coaching performance. Vedantham (2007) reported that New England Patriots head coach Bill Belichick (himself an economics undergraduate major) applied research by Romer (2006) when he decided to go for a first down in a fourth-down situation in which coaches usually punt. Given Belichick's three Super Bowl wins and a near miss in the 2007 season (the same season during which he went for the fourth down), it is not surprising that he would try to get every edge possible. That he would do so through careful study of scholarly works is an indication of both the value of the research and of the coach. While this anecdote proves nothing, it offers insights into the roles of the coach and the sports scholar. The value of the coach is the topic for the remainder of the chapter.

11.2 Sports Management Studies

How can we measure the "value" of a coach? The first economic response is usually "by what someone is willing to pay for it." (see, e.g., Sowell 2007) Simply look at the salaries of NFL coaches, rank them, and congratulate yourself on a job well done. Unfortunately, there is an element of tautology in such pronouncements. This becomes painfully obvious when highly paid (even by NFL standards) coaches are fired for "lack of performance". Such performance could be measured in winning percentage, playoff wins, attendance figures, etc.

Valuation methodologies are fraught with pitfalls. Simply looking at winning percentages ignores the effects of the player personnel, front offices, owners, and other factors which would be expected to lead to on-the-field wins. Many questions persist. Does the coach have any player-acquisition authority, and if so, how much? Has the coach been given sufficient time to implement his system? Is the coach given adequate autonomy? (How would we determine "adequacy of autonomy"?) The problem is exacerbated by cases in which a coach is also a general manager, a situation that is rarer today but was not uncommon in previous decades.

Comparing coaching analyses across sports and across levels within sports is similarly caveat-laden. Coaching responsibilities differ by sport and level. Baseball managers and football coaches face different challenges, as the durations of the seasons differ greatly. The physical nature of football requires different player motivation. College coaches have the responsibility of recruiting their players. Strong recruitment skills are extremely important. NFL coaches do not recruit, but nevertheless face extreme consequences of unsatisfactory talent. Heavy involvement in the draft and trades is virtually a necessity.

Studies of coaching efficacy have varied in focus. Some focus on the "added value" of the coach. Others assess coaches' "productivity." "Survivability," "efficiency", and "assessment" of how coaches meet promotion criteria are other types of coaching-effectiveness analysis. In this section, these categories are reviewed.

11.2.1 Coaching Productivity

In general, productivity is the quantity of good and services produced from each unit of labor input. (see, e.g., Mankiw 2009). In football, the productivity of a coach measures the efficacy of conversion of process inputs, such as player talents, into measurable observable outputs, such as points scored, yards gained, wins, margin of victory, etc. Since many outputs are easily measured, sports allows for careful analysis of coaching productivity.

Hadley et al. (2000) studied the productivity of NFL coaches from 1969–1992 applying a Poisson regression model. This treatment is similar to that of Ruggerio et al. (1996), which augmented previous studies by Horowitz (1994), Kahn (1993), and Porter and Scully (1982) for baseball managers. The purpose of the study was to determine whether or not coaching is a significant component of the process, and if so, what specific effect was present.

The conclusion of Hadley et al. (2000) is that quality coaching is a significant component in the process. The specific effect is approximately 3.5 wins/season. The authors also established performance indices for the NFL coaches over the 1969–1992 period. Coaches with high indices included Don Shula, John Madden, and Tom Landry. At the other end of the spectrum were John McKay, Bart Starr, and Dick Nolan. One may note that Shula and Landry are two of the coaches with the highest win totals in NFL history, while McKay and Starr presided over teams with extended losing periods. These results are not likely to surprise the football cognoscente.

Goff (2010) uses a similar methodology to compare the relative importance of managerial inputs (owners, general managers, and coaches/managers) for the MLB and the NFL over the 1970–2009 seasons. Coaches/managers, general managers, and owners who served a minimum of 7 years are then ranked according to their standardized scores. Managers/coaches and general managers were statistically significant inputs for the NFL and MLB. One result regarding NFL coaches is a higher level of relative importance to general managers than in baseball. Bill Walsh earned the highest individual standardized score for NFL coaches, followed by Jeff Fisher, Steve Mariucci, and John Robinson. John Madden, Tom Landry, and Don Shula also earned high scores, but placed lower than in the analogous Hadley et al. (2000) study (due in part to the differing time-frames used). Goff (2010) also notes highly regarded coaches such as Paul Brown, Bill Parcells, and Bill Belichick who did not have high scores.

The differences in the coaching scores attained in Goff (2010) and Hadley et al. (2000) indicate that the inclusion of owners and general managers into the model may have an effect. This is not surprising given the different environments in which coaches work. Some owners and general managers are more frugal, and some work more harmoniously to create a cooperative atmosphere. In any event, including general managers and owners in the model does not change one fundamental fact. Coaches are a significant input into the team productivity.

11.2.2 *Coaching Efficiency*

Efficiency is a ubiquitously used term across many disciplines and settings. In economics, efficiency refers to getting the most out of scarce resources. (see, e.g., Mankiw 2009). The term "managerial efficiency" is more nebulous. Darnton and Darnton (1997) differentiate between "technical efficiency" and "allocative efficiency" of managers. Technical efficiency represents some measure of output quality relative to some input quantity. Allocative efficiency measures the value of outputs relative to the cost of inputs. In either case, higher efficiency exists when "better" outputs are obtained from given input. With coaching efficiency, the outputs are winning percentage, average win margin, etc. The inputs are players, general managers, owners, etc.

Measuring coaching efficiency is difficult. Each coach operates in a different milieu, and no two teams have comparable player talent. To accurately measure relative coaching efficiency, we would need to compare different coaches with the same talent, owners, general managers, etc. This is obviously impossible. The best that can be accomplished is to control for as many factors as possible.

Zak et al. (1979) analyzed production efficiency in professional basketball using National Basketball Association (NBA) data from the 1976–1977 season. Applying the frontier estimation technique due to Richmond (1974) and a Cobb-Douglas production function, they assessed a set of input variables, including field goal percentage, personal fouls, and home court, to estimate a production function. Coaching was not included in the study.

Depken and Wilson (2010) are studying relative coaching efficiency in NCAA Division IA football for the 1990–2003 seasons using stochastic frontier analysis of Aigner et al. (1977) with enhancements of Battesse and Coelli (1988). They offer contribution measures and rankings for each of the 168 head coaches during the span. The number of wins is the process output. The four inputs used are: total points scored, the inverse of total points allowed, the strength of the team's opponents, and the head coach's experience.

The preliminary results show a significant positive relationship between coaching experience and team technical efficiency, with diminishing returns due to experience. Teams with higher technical efficiency tend to be associated with a higher winning percentage. What is a bit surprising are the efficiency figures for the individual coaches. Highly regarded names such as Lou Holtz, Howard Schnellenberger, and Hayden Fry populate the top decile. Other prominent personalities such as Gene Stallings, Pat Dye, and Nick Saban were interspersed in middle to upper deciles, but were not among the top one. Similarly, coaches in the lowest decile include Rod Dowhower, Joe Kines, and Dave Kragthorpe, each of whom lasted only a year on the job.

While the college game and coaching thereof differ in many respects from their NFL counterparts, the methodology employed by Depken and Wilson (2010) is applicable for NFL coaches. Specifically, one could follow and individually assess the managerial efficiency of each NFL coach over a given time period. Additionally, relationships between efficiency and other variables could be investigated.

Scully (1994) constructs measures of managerial efficiency for coaches in baseball, basketball, and football coaches using three frontier functions. (The frontier functions will be discussed in detail in Sect. 10.3). The purpose of the study was to compare survivability (i.e., coaching tenure) across sports as a function of managerial efficiency. The results are discussed in more detail in Sect. 10.2.3. One item of note is the "owner-manager" problem, which is a special case of the principal-agent problem. Related is the existence of some coaches in several sports, most notably football and basketball, who have also served as general manager of their teams. Thus, they are responsible for player acquisition in a manner somewhat analogous to that of college coaches. In any event, coaches who also serve as general managers are unable to spend as much time in each capacity as separate coaches and general managers can. Future analysis of relative managerial efficiency must take these issues into consideration.

11.2.3 Coaching Survivability

In addition to looking at managerial efficiency, Scully (1994) analyzed survivability of coaches and its relationship with efficiency. Kaplan-Meier survival curves with Greenwood confidence bands graphically illustrate the differences in managerial tenure for professional coaches in baseball, basketball, and football. For baseball managers, the probabilities of surviving for different durations were highest for most tenure times, and similarly lowest for basketball coaches. Football survival probabilities were between the other sports, but were closer to those for basketball. Using a log rank test, the three survival curves were statistically different.

The survival times were significantly related to managerial efficiency for all three sports, as a result of a Weibull regression. As efficiency increases, expected tenure increases for coaches in the three sports. The expected increase has a much higher rate of increase for basketball and baseball relative to football. This could indicate that the market tends to reward football coaches less generously for higher performance, or that football coaches are more likely to move to other teams when they have proven to be successful. It could also reflect a different intrinsic nature of the three sporting industrial environments. Regardless, it appears that efficient NFL coaches are less likely to remain in their positions for long terms relative to their counterparts in the NBA or MLB.

Coaching tenure takes on a different meaning for the analysis of Goff and Wisley (2006), in which data from 1920–2004 (which accounted for all NFL seasons through 2004) were used to assess the effects of age on coaching performance. Based partly on past studies by Scully (1995) and Fair (1994), they employed a regression model and found evidence that performance tends to increase with age up to a point, following which performance diminishes. The turning point age estimated in the model is 43.5 years.

One possible explanation for the phenomenon of a managerial life-cycle is from human-capital theory. (see, e.g., Becker 1962 or Ben-Porath 1967). In the early part of a career, a coach (or any manager) invests heavily in human capital. Once a head coach, the fruits of the labor are realized. As coaches age, the incentive to invest in human capital tends to diminish over time. It must be remembered, however, that coaches with long tenures are invariably successful. One would infer erroneously when using the human-capital theory and assuming universally that long-serving coaches will produce poor results on the field. Disagreements regarding when coaches (or players) should retire or be fired has been the fodder for many a sports talk show.

11.2.4 Coaching Promotions

The work of most of the other studies discussed so far has focused on the performance of head coaches already in the position. The issue of promotions can be contentious, leading to much controversial discourse. Fairy tale scenarios such as Mike Tomlin leading the Pittsburgh Steelers to a Super Bowl victory in his first season as head coach, or Tony Dungy finally winning the Super Bowl with the Indianapolis Colts after years of being a highly touted but non-promoted assistant coach are uplifting motivational topics. Unfortunately, some otherwise similar situations end far differently. Richie Petitbon, like Dungy, was a well-respected defensive coordinator for many years. Upon the retirement of Joe Gibbs, Petitbon was named head coach of the Washington Redskins. His first and only season (1993) started in promising fashion, with a 35–16 thrashing of the reigning champion Dallas Cowboys. Injuries, however, doomed the remainder of the season, and Petitbon was unceremoniously ousted after the season.

Job openings may be filled in several ways. The first is through a lateral move. A head coach or offensive coordinator for Team A could move to the same position at Team B. A second option is to select a coach holding a lower position with another team. It is quite common for highly touted offensive or defensive coordinators to be leading candidates for head coaching openings. Finally, a team can opt to promote from within its own ranks. A position coach may move up to offensive or defensive coordinator, and a coordinator may similarly become head coach.

Work by Fama (1980) and Holmstrom (1982) on general labor markets would tend to be consistent with an assistant coach being more likely to receive a promotion with a different team based on superior individual performance. Conversely, internal promotions are subject to a different incentive structure. The tournament view of promotions of Lazear and Rosen (1981) supports the promotion of highly performing individuals. Baker et al. (1988) argue that promotions based on internal incentives may cause a less than optimal set of individual job assignments. Thus, there is a tradeoff between the incentives created by the prospects of an internal promotion.

Fee et al. (2006) studied promotions in the NFL over the 1970–2001 seasons using logistic regressions, with an emphasis on differentiating between internal and external markets. They offer several interesting findings, most notably that internal and external labor markets exhibit different behavior in the NFL. Individual performance is significantly related to the likelihood that an assistant coach at the level of coordinator (or assistant head coach) will be promoted to head coach of a different team. For internal promotions, individual performance is actually insignificantly negatively related to the likelihood of attaining the higher position.

There are several possible explanations for the findings. Previous work on external and internal labor markets suggests differences in incentive structures. One problem is the environment of position openings. When a vacancy exists, it is due to a coach leaving to take a position elsewhere, resigning (either voluntarily or by force), retiring, dying, or being fired. In the case in which the coach left voluntarily, a strongly performing assistant coach would often have a high chance of getting the job. For the other case, it is likely that the team has not performed well (at least as deemed by the owner or general manager). This situation is likely to facilitate hiring externally. In many such instances, all or most of the coaching staff is fired, whether by the owners and managers or by the subsequently hired head coach.

Fee et al. (2006) note that some interesting incentives can be created. An individual coach would appear to always have an incentive to perform well individually. This is especially true for getting a higher-level position with a different team. It will also likely help if his strong individual performance helps the team perform well overall, and thus lead to a promotion when the head coach retires or moves to another team. If he can perform well while the team performs poorly, he is more likely to get an internal promotion, since the head coach is likely to be fired. Given the relatively high mobility and volatility of NFL coaching jobs, the evaluation and assessment of assistant coaches is a constantly occurring process. Management would do well to carefully consider the potential incentives created by each promotion, since these will set the tone for future real and perceived incentives for the organization.

11.2.5 Discrimination

Given the previously discussed inherent difficulties in the promotion process, selection of coaches is rife with pitfalls. The changing demographics of the NFL with respect to the high concentration of African-American players relative to white players (and extremely high relative to the proportions in the population in general) have generated concern that the proportion of African-American head coaches is not higher. These concerns led to the establishment in 2003 of the Rooney Rule (named for Pittsburgh Steelers' owner Dan Rooney), which requires NFL teams to interview minority candidates for head coaching or senior football operations positions.

The issue of racial discrimination in the selection of coaches has subsequently received much recent attention among the media in general and sports media in particular. Kahn (1991, 1992) studied the overall issue of race and discrimination in professional sports, and of player compensation in the NFL. Madden (2004) looked at NFL coaching data over the 1990–2002 seasons, concluding that the results indicate consistency with African-American coaches being held to a higher standard to obtain jobs than their white counterparts.

Madden (2004) employed a logistic regression model, in which partial seasons (i.e., seasons in which a coach was fired prior to the end of the season) were excluded. In the analysis, African-American coaches averaged a statistically significant 1.1 win more than white coaches for the full seasons, a statistically insignificant lower playoff winning percentage, and a very significant 2.5 more wins in their first seasons. Madden (2004) concludes that African-American coaches have to be better than white coaches to be hired, and that African-American coaches are significantly more likely to be fired. These are attributed to evidence of race-based discrimination.

Malone et al. (2009) analyzed NFL coaching data over the same time period using logistic regression with the inclusion of the partial seasons, and added four additional seasons from 2003–2006. Since many coaches are fired during the season, eliminating partial seasons tends to bias the results. Inclusion of the partial seasons renders the racial differences insignificant. The data for the complete 1990–2006 period yielded similar results. Furthermore, all of the African-American coaches fired during the study period were subsequently rehired, which is inconsistent with the discrimination hypothesis. In any event, even if the differences in performance had been significantly different, it would not offer evidence of selective hiring processes, but in the firing processes.

Despite the different outcomes, Malone et al. (2009) caution that the possibility of racial discrimination cannot be ignored, and that the paucity of African-American head coaches itself should continue to receive attention within the industry. One issue is that regression analysis is simply incapable of establishing causal relationships. Another important issue is that of the pipeline (i.e., the assistant coaches). A lack of African-American assistant coaches creates a difficulty when trying to hire, regardless of the existence of the Rooney Rule.

One further issue is the Rooney Rule itself. Policies such as the Rooney Rule are subject to unintended consequences. Teams may always give a perfunctory interview to a minority coach, even in cases in which the actual hiring is essentially a fait accompli. In other cases, the fear of negative perceptions regarding the decision either not to hire an interviewed minority candidate or to fire a minority head coach may lead teams to be less likely to interview or hire minority candidates. This is not to suggest that such decisions are always conscious, or that they are widespread. However, to assume that the incentives do not exist is to avoid careful economic analysis. Whether and how this will be ameliorated is likely the substance of many future studies.

11.2.6 Other Coaching Effectiveness Metrics

A different approach to assessing managerial performance is to consider the financial returns generated by the manager. This offers a radical departure from the other performance metrics. In a professional sports setting, team revenues and profits are appropriate signs of economic success. One may counter that many other factors, such as the size of the market, have an impact on the bottom line. Nevertheless, financial "success" associated with a coach is a potential indicator of coaching effectiveness.

Bernard (2006) investigated the return on investment (ROI) for executive management coaching programs. The motivations for the study include the high amount of spending on executive coaching programs, increased scrutiny on all expenditures due to the current economic conditions, and the necessity of separating effective and ineffective coaching. This is a vastly different setting from the NFL. However, the analogs for football coaching may be determined in a straightforward manner.

The three main conclusions from the Bernard (2006) study are at least partially applicable to an analysis of professional sports coaches. First, factors other than coaching effectiveness may contribute to stronger economic performance. Second, ROI is relevant only as compared to other firm investment decisions. Finally, time value of money must be considered over some time horizon.

Clearly, there are many factors that relate to the economic success of a sports franchise. The New York Yankees are a prime example. The location and history of the team have contributed to making them an enduring financial winner in the MLB and across all professional sports. Smaller-market teams such as the Milwaukee Brewers or the Tampa Bay Buccaneers are faced with different obstacles. Having players who are major draws such as Lebron James in basketball tends to increase attendance and generate more television appearances, which in turn increases revenues. These and other factors must be controlled in a study of ROI for coaches.

A relevant issue is the effect of the salary cap on the movement of NFL talent. Berri et al. (2006) discuss the limitations on the distributions of playing talent in the MLB, as predicted by the Coase Theorem (and Rottenberg), which says that resources (players) will go to the firms (teams) for whom they have the most value, and this is invariant to their current ownership. (see Coase (1960) and Rottenberg (1956)). This effect is undermined by the salary cap for NFL players, but not for coaches (for whom no analogous cap exists). Whether the salary cap has any effect on the ability of coaches to contribute to the financial success of the firm is a subject which warrants further study.

The time value of money consideration is not relevant in the sports coaching context, since sports coaching is an ongoing enterprise as opposed to a one-time event as in career coaching. The time value of money is contingent on interest rate fluctuations, something over which a coach has no control. A coach who generated a high rate of return in 1979 would have a favorable performance relative to a coach with a similar performance in 2005 because of the disparate prevailing interest rates. Also, the most relevant comparisons are with other coaches during the same time intervals, given the zero-sum nature of the regular season.

11.3 Applicable Methodologies

In this section, we discuss specific techniques which have been applied in the analysis of managerial efficiency. Many readers are likely unaware of some or all of these methods. It is not the intent of the authors to attempt to offer a compendium of the techniques from all of the studies discussed herein. Many of the methods used (such as different types of regression analysis) are well-known to the likely audience.

It should also be noted that numerous other methodologies that were not used or discussed herein are potentially applicable in the analysis of coaching and managerial efficacy. The ones discussed here are the ones with high applicability and appropriateness but which are also more obscure among many practitioners.

All of the methods discussed are used to estimate the relative efficiency of decision-making units (DMUs), i.e, the relative performance with respect to converting a set of measurable inputs (or at least those which can be ranked) into a set of similarly measurable outputs. DMUs with high efficiency levels obtain high output from given inputs, and would be expected to obtain a high level of output from lower or higher levels of input relative to other DMUs in the sample.

Managerial efficiency methods typically determine the "maximum possible efficiency" across the output and input values from all DMUs in the sample. The DMUs are then assigned individual efficiency values relative to the maximum. "Perfect efficiency" is associated with an efficiency value of one, while "perfect inefficiency" has a value of zero. Values between zero and one have increasing efficiency across the continuum.

For analyses employing the methodologies to resonate with practitioners, the more efficient DMUs would be expected to correlate to a reasonably high degree with the expectations of the "eye test". In the NFL context, a coach who is highly respected and who has demonstrated over time the ability to get high performance from players under the varying circumstances associated with many seasons in the league would be expected to be assigned a high efficiency value. Coaches such as the Patriots' Bill Belichick and former Steelers' Bill Cowher are examples. Analogously, an efficacious method would also tend to assign low-efficiency values to coaches at the other end of the spectrum. This is not to say that efficiency scores should perfectly correlate with the opinions of observers. Indeed, the entire point of quantifying efficiency is to offer an objective assessment of performance.

The techniques used to measure efficiency for DMUs discussed here are nonparametric (data envelopment analysis), parametric (stochastic frontier analysis), or hybrid. The hybrid version of Tofallis (2001) uses elements of the nonparametric and parametric methods. The methods are presented superficially, with references for further reading.

11.3.1 Data Envelopment Analysis

Data Envelopment Analysis (DEA) was developed by Charnes et al. (1978), with the initial application to not-for-profit entities. Talluri (2000) and Anderson et al. (2008) offer excellent introductions to DEA. In this section, we employ the same notation and form as in Talluri (2000). DEA can be performed as an application of linear programming (LP), and may be performed using any LP software (such as LINGO) that can accommodate what are typically large numbers of input and output values.

In DEA, the efficiency score is the ratio of a weighted-sum of outputs to a weighted-sum of inputs. The output and input values are the data. For NFL teams, possible outputs include winning percentage, point differential, and yardage differential. Potential inputs are measures of player ability (such as draft position), money spent on facilities, experience of assistant coaches, etc. The specific weights are the decision variables for the linear program. Note that the program constructs a hypothetical composite of all DMUs using a weighted average, and the relative inefficiency of a given DMU is established in comparison to the composite DMU.

The linear program formulation for a specific (pth) DMU is as follows.

$$\begin{aligned} &\max \sum_{k=1}^{s} v_k y_{kp} \\ &s.t \sum_{j=1}^{m} u_j x_{jp} = 1 \\ &\sum_{k=1}^{s} v_k y_{ki} - \sum_{j=1}^{m} u_j x_{ji} \le 0, \forall i \\ &v_k, u_j \ge 0, \forall k, j \end{aligned} \tag{11.1}$$

where k =1, 2,…s, j =1, 2,…m, i =1, 2,…n, y_{ki}=amount of output k produced by DMU i, x_{ji}=amount of input j utilized by DMU i, v_k=weight given to output k, and u_j=weight given to input j.

To determine the relative efficiency scores for all DMUs, the LP is run n times. In each run, the program selects input and output weights that maximize the efficiency score for the pth DMU. A score of one is the highest attainable efficiency value. The DMU is considered to be less efficient as the attained score approaches zero.

The dual of the LP may be used to identify a set of corresponding efficient units that can be used as benchmarks for improvement. The dual of the LP is given by

$$\begin{aligned} &\min \theta \\ &s.t \sum_{i=1}^{n} \lambda_i x_{jp} \le 0, \forall j \\ &\sum_{i-1}^{n} \lambda_i k_i - y_{kp} \ge 0, \forall k \\ &\lambda_i \ge 0, \forall i \end{aligned} \tag{11.2}$$

where θ=efficiency score, and λ=dual variables.

Based on the dual output, a DMU is deemed inefficient if a composite DMU (linear combination of DMU units) can be identified which utilizes less input than the test DMU while maintaining output levels at least as high as those obtained. The DMU units used in the resulting composite DMU can be considered benchmarks for improving the given DMU efficiency. Unfortunately, specific measures for improvement are not prescribed by DEA.

For the example of NFL coaching, the LP and dual would be run for each team to determine relative inefficiency. Each coach would be assigned a score, with higher scores indicating less relative inefficiency. The dual could be used to determine benchmarks for improvement. The decisions required to reach or exceed the benchmarks would be up to the coach and organization. DEA itself offers only the description of relative inefficiency.

11.3.2 Stochastic Frontier Analysis

Stochastic Frontier Analysis (SFA) was developed independently by Aigner et al. (1977) and Meeusen and van den Broeck (1977), and is based on work by Farrell (1957). The motivation behind SFA is to develop an estimate of the production frontier, or fully efficient production function. Based on the fully efficient production function, each observed case can be assessed relative to full-efficiency. The frontier is "stochastic" in that it varies over firms. Note here that "efficiency" refers to technical efficiency. Allocative efficiency is not considered.

The production function for an individual DMU (coach) with a random component can be represented as:

$$y_i = f(x_i, \beta)\exp\{v_i - u_i\} \tag{11.3}$$

where y_i is the output of the DMU i, $i = 1,..I$, x_i is a vector of N inputs used by the DMU i, $f(x_i, \beta)$ is the production frontier, β is a vector of technology parameters to be estimated, v_i is the white noise component (which is usually assumed to be a Gaussian random variable), and u_i is the nonnegative exponentially or half-normally distributed random variable capturing the technical inefficiency. The overall error term (often designated ε) is the sum of the white noise and technical inefficiency components.

TE_i denotes the technical efficiency as defined as the ratio of observed output to the frontier output. A value of $TE_i = 1$ shows that the *ith* firm obtains the frontier output, while any $TE_i < 1$ is relatively inefficient. The difference TE_i and one is a measure of the difference between the observed output and the frontier output.

The functional form of $f(x_i, \beta)$ must be specified. Often, the log-linear Cobb-Douglas form is used. (see, e.g., Cobb and Douglas 1928). Using the Cobb-Douglas production function form, the model can be written as:

$$\ln(y_i) = \beta_o + \sum_n \ln(x_{ni}) + v_i - u_i \tag{11.4}$$

Regression analysis is typically used to estimate the function in (11.4). As with any regression model, diagnostic tests for appropriateness should be used. Once estimated, firm-specific technical efficiency can be calculated using the Battesse and Cora (1977) approach as enhanced by Jondrow et al. (1982) and Battesse and Coelli (1988). The firm-specific technical efficiency is calculated using

$$\mathrm{TE}_i = \left[(1-\Phi(\sigma_A + \gamma e_i / \sigma_A)) / (1-\Phi(\gamma e_i / \sigma_A))\right] \exp(\gamma e_i + \sigma_A / 2)$$

where

$$\mathrm{e}_i = \ln(\mathrm{y}_i) - \mathrm{x}_i \beta, \quad \text{and} \quad \sigma_A = \sqrt{[\gamma(1-\gamma)\sigma^2]} \tag{11.5}$$

In the coaching application, the regression model can be used to determine which inputs are most significant for producing high outputs. Coaches can then be assigned technical efficiency values for relative comparisons. This is the methodology used by Depken and Wilson (2010). Overall, SFA offers the advantage of the estimated frontier. If the conditions necessary for the appropriateness of regression are warranted, SFA is appropriate for efficiency assessment.

11.3.3 A Hybrid Approach

Tofallis (2001) presents a hybrid approach for efficiency assessment that uses DEA and regression analysis. All necessary work was performed in Microsoft Excel, but may also be applied using other spreadsheet packages.

The hybrid approach is summarized as a three-step process. Step one consists of using DEA to identify the efficient units (i.e., the composite DMU). The second step is an application of canonical correlation analysis (CCA). (see, e.g., Johnson and Wichern 2008). The efficient units found in DEA are used in the CCA to maximize the correlation between a function of the outputs versus the inputs.

If the correlation value obtained in step two is high enough (compared to a prespecified value), then step three is performed. In step three, simple regression analysis is used to obtain a representation of the production frontier. Each DMU may then be viewed with respect to the frontier to determine relative inefficiency.

An advantage of the hybrid approach (as with SFA) is that you obtain an estimate of the frontier function, and thus are able to view relative DMU performance graphically. Whether this advantage is worth the additional work required beyond DEA is at the discretion of the user. In any event, it offers a third alternative for efficiency estimation of NFL coaches.

11.3.4 Other Methodologies

The three methodologies discussed so far may be used to analyze managerial efficiency. Many other quantitative techniques should be useful for general studies of managerial performance. Again, this is hardly an exhaustive listing.

Financial analysis can be used to assess the contribution of a coach or other manager to the economic well-being of the firm. Returns on assets (ROA) and investment (ROI) are two typically used measures to determine what monetary output is received. Ticket sales, television appearances, and other revenue sources generated are measures of financial success due to a player or coach. Establishing what portions of such values were generated by specific individuals is a challenge in this type of analysis.

Similarly, valuation techniques offer the opportunity to obtain market prices for different entities. (see, e.g., Damodaran 1996). Coaches, managers, and players could be assigned market values. Unfortunately, such analyses are often arduous. Obtaining values for a large number of coaches (as is required for comparative analysis) would likely be an ambitious undertaking.

Multivariate statistical analysis includes several potentially applicable methods, including the aforementioned CCA. Factor analysis and cluster analysis could be used to find overlap among certain coaches with respect to relative efficiency. This helps determine what factors relate to high efficiency. They could also be used to determine other variables to use in the analysis. Structural equation modeling could be employed in this type of assessment. (see, e.g., Johnson and Wichern 2008).

The multivariate techniques discussed here are commonly used in management and marketing research. Up to this point, we have not discussed management. Given that we are addressing measures of *managerial* success, we would be remiss omitting the potential contributions from the field of management. Similarly, research in fields such as sociology and biology could be applicable. Coaching success requires contributions from the entire organization, and is likely a synergistic process. Sociology, as the study of group dynamics, is likely to add perspective in process analysis. Furthermore, firms may be viewed as organisms within a species (industry), and hence are analogous to biological phenomena. Application of results from biology offers potentially fruitful future endeavors.

Given the attention to the manager as a decision-maker, behavioral/experimental economics seems to be an obvious source of possible studies. (see, e.g., Thaler and Mullainathan 2008). The questions regarding what drives certain decisions contains a strong element of cognitive science and psychology. Behavioral economics incorporates psychological facets and allows for experimental analysis. How such experiments could be run is an interesting question. Decisions such as when coaches go for it on fourth down (as previously discussed), go for two points rather than kick a PAT, attempt onside kicks, or accept or decline penalties are excellent examples of choices that lend themselves to behavioral analysis.

11.4 Summary, Implications, and Future Research

The effects of coaching on team success have long been the topic of aphorisms. Bum Phillips' folksy "he can take his'n and beat yourn, and then that yourn and beat his'n" referred to the winningest coach in NFL history, Don Shula. In contrast is the much older "you can't make a silk purse out of a sow's ear." Such a juxtaposition underlies the difficulty in assessing the impact of a manager in general, and a sports coach in the current study. The problem is further exacerbated by the differences in owners, general managers, and other environmental factors.

Some owners, such as the Cowboys' Jerry Jones and the Yankees' George Steinbrenner, are more likely to spend money to get better players. This may be due to the size of the local market, the size of their bank accounts, or some combination of both along with personal prerogative. Certain organizations have created a purported "positive atmosphere", such as in New England under owner Patriots' Robert Kraft or in San Francisco in the eighties and early nineties with Forty Niners' general manager Carmen Policy. Other teams are less willing to pay, and some create adverse circumstances for their employees. The spending cap imposed by the NFL further complicates matters.

The success of a coach as determined by his ability to facilitate the transformation of inputs (such as players, other coaches, etc). into positive outputs (such as a high winning percentage, large point differential, etc). is the subject of the current study. There are varying specific measures of success, depending on the objectives of the particular study. Efficiency, productivity, survivability, suitability for promotion, and financial profitability are a few examples. Each category offers multiple potential "success" metrics.

The studies discussed herein employed many different research methodologies (and often multiple techniques within a given article). Managerial efficiency estimation methods such as data envelopment analysis (DEA), stochastic frontier analysis (SFA), and the hybrid deterministic/stochastic approach have been used and/or can be used in future investigations of coaching- efficiency. Other more widely used techniques from statistics, economics, finance, and other social sciences have been and may be used as well.

For the studies directly assessing coaching efficacy in the NFL, coaches who are found to be efficient or productive have been shown to be significantly related to team success. One result is that efficient coaching can account for an additional 3–4 wins/year. More efficient coaches tend to have longer tenure, though with lower likelihood than for baseball or basketball. With respect to coaches with tenures, there is a life-cycle for NFL coaches, with a peak around age 43.5.

There is a difference between the likelihoods of promotions of assistant coaches in the external and internal labor markets. Coaches with strong individual performance metrics are more likely to obtain head coaching jobs with teams other than their current one. For the internal market, the effect is insignificant but the likelihood of getting a promotion within the organization is actually lower when the coach exhibited high individual performance.

The issue of discrimination in the hiring of NFL coaches warrants further attention. Madden (2004) concludes that the data suggest discriminatory hiring practices against African-American coaches by NFL teams. Malone et al. (2009) offer contradictory evidence. In any event, more than simple statistical disparities must be found to establish definitive evidence of discrimination. (see, e.g., Sowell 2008). In this regard, regression analysis cannot be used to show causation.

An investigation of comparative efficiency between white and black coaches seems an obvious extension of the current research. Sports in general has been a leading example, and indeed the epitome of a meritocracy, and the resulting incentives against discriminatory hiring practices would seem to be powerful. Nevertheless, the dearth of African-American head coaches will continue to warrant consideration until it is ameliorated.

The human-capital aspect of labor is integral to the analysis of the managerial life-cycle. This leads to the question of what types of capital are most highly related to coaching efficiency. What are common areas in which successful coaches have attained high levels of human capital? What types of human capital are less important? This is an area in which factor analysis and other multivariate statistical analysis could be useful.

Behavioral and experimental economics and finance offer an expanding set of methodologies which may be used to study coaching efficacy. What are the likely decisions coaches would make under certain circumstances? Do these decisions reflect “rationality”? These questions apply not only to game-day decisions, but to choices regarding when to seek certain jobs, what assistant coaches to hire, what offense/defense to use, what general philosophy to adopt, etc.

There has been minimal attention given to the issue of cap spending and coaching success. Are there more successful strategies available? It is possible that certain types of players are less expensive and more coachable. There is a psychological element inherent in such analysis, and cognitive science and behavioral economics may offer insights. Managing the spending cap is a challenge for all management of every team. Perhaps the efficiency of a spending strategy could be evaluated relative to the “best” strategy.

This is merely a short list of possible future studies in the assessment of coaching performance. It is an exciting area for further investigation. Some of the possibilities simply require replicating similar studies from other sports or levels. Others would involve applying methodologies previously used in analogous managerial analyses. Given the ever-growing corpus of mathematical and statistical applications, the possibilities are vast.

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Part IV
Other Matters

Chapter 12
Competitive Balance in the NFL

Rodney Fort

> *The league has clearly been stratified this year—there are the top contenders, and then there's everyone else… Pundits everywhere are decrying the blowouts and questioning what can be done.*
>
> Gleason (2009).

> *Green Bay's win in Super Bowl XLV is a tribute to the competitive balance in the NFL.*
>
> Brandt (2011).

12.1 Introduction

The epigram centers on the eternal question of competitive balance: How likely is it that early-season fan hopes for postseason play are realized? The epigram also points out how confusing a discussion of balance can become; how can the NFL go from "clearly stratified" to a tribute to balance in 2 years? In this chapter, I pursue an assessment of competitive balance in the NFL in order to shed light on this eternal question. Such an assessment also clarifies where and when balance in the NFL became an issue, if it ever was.

In the original paper on the economics of sports, Rottenberg (1956) posited what is now called the uncertainty of outcome hypothesis and just why it is that outcome uncertainty is important. If fans of the perennial also-rans lose interest in their home team, and then lose interest in a sport's offering in general, even the remaining teams will suffer reduced support during the postseason determination of champions. Any sort of growing competitive imbalance over time could prove detrimental to the sustainability of the league.

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Rottenberg's main point is that balance becomes a matter of concern for those governing play. In pro football, that would be the NFL. Everybody recognizes this. Even in striking down some of the NFL's practices, the antitrust decisions in *American Needle v. NFL* always remind the reader that the primary justification for single entity behavior is the fan happiness caused by balance in outcomes on the field.

One of the difficulties in addressing issues of competitive balance is keeping the discussion on course in terms of its many facets. There is "game uncertainty." This seems to be what upsets Gleason in the epigram—How close are the scores of individual NFL games? There is also "end-of-season uncertainty." How tightly are teams in a conference bunched together in the final regular season outcome? There also is "postseason access uncertainty." This seems to be Brandt's focus in the epigram—How equal are the opportunities at postseason play and, an important variant, opportunities to win in postseason play? Finally, there is "season-to-season uncertainty." This is the issue surrounding dynasties. Do a few franchises simply lord over the game in a consistent fashion?

In this chapter, I take a look at all of these elements except game uncertainty. While scores exist, simple comparisons of game closeness require a somewhat arbitrary choice of what constitutes a close game and a massive amount of data analysis (and there are enough arbitrary choices in what follows). It also seems to me that it is actually the eventual outcome at the end of the season, and between seasons, that are the main focus of those interested in balance.

I stress from the outset that mine is a tracking exercise to judge how balance has behaved over time. Ultimately, balance matters in terms of its effect on fan attendance and media use patterns, but demand analysis is beyond my aim (Fort and Maxcy 2003). I also investigate the approaches that the NFL used in the name of enhancing balance to see if they mattered. Since nearly all of them occurred in the last few decades, I stick (mostly) with the modern, postmerger NFL (1970–2010). The upshot of my findings is that either balance appears not to be much of a goal, or the NFL is simply awful at trying to enhance it, or there are other motives behind the actual mechanisms used to enhance balance.

12.2 End-of-Season Winning Percents

End-of-season uncertainty can be tracked as follows Fort (2011). The standard deviation of final winning percents measures the dispersion of final winning percents around the conference mean, 0.500. The larger the standard deviation, the wider the dispersion and the more imbalanced is the final outcome. The standard deviation contains the number of teams but not the length of the season. Sports economists commonly refer to an amended version of standard deviation analysis as the Noll-Scully "ratio of standard deviations" (or RSD, for short). Let ASD be the *actual standard deviation* of final season winning percents. Fort and Quirk (1995) show that an "idealized" *standard deviation* (ISD), if the probability any team could win any game is 0.5, ends up to be $\mathrm{ISD} = 0.5/\sqrt{N}$ where N is the number of games in

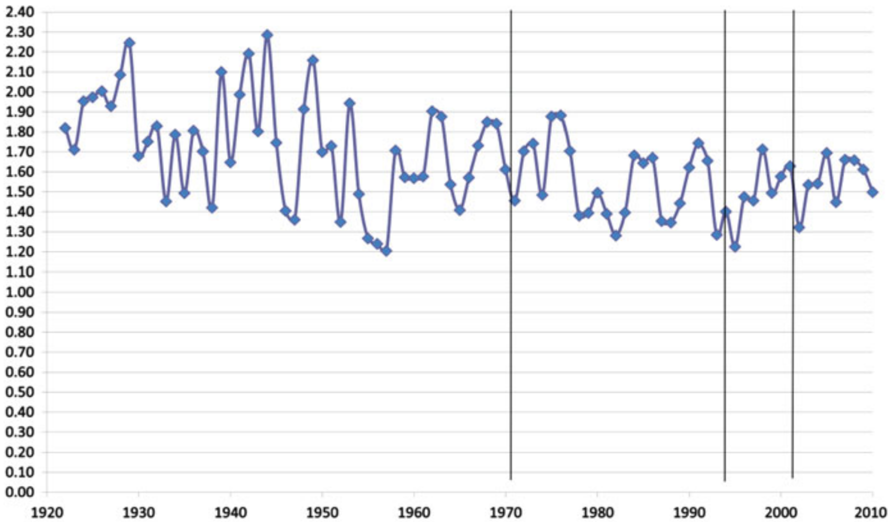

Fig. 12.1 RSD, 1922–2010. *Source*: Appendix 1

the season. The Noll-Scully measure is RSD = ASD/ISD. If RSD equals 1, then ASD = ISD; the actual standard deviation in a conference is the same as the ISD of a balanced conference. The farther RSD is from 1 the less balanced is the conference. A difficulty with RSD is that little is known about its sample properties so making statements about "significance" or "significant differences" must be done on the basis of what a room full or reasonable people might agree (but some efforts in that direction have occurred, e.g., Owen 2010).

Since the 16 game schedules for each includes only a minority of games within conference, I examine the final winning percent outcomes for the NFL at large. The history of RSD for the NFL is in Appendix 1. Cutting straight to the chase, judging by RSD over the NFL's entire history, the league has never really been composed of what one could call an evenly matched set of teams. A room full of reasonable people wouldn't find many RSD values close to one in Appendix 1. The data in Appendix 1 are charted in Fig. 12.1.

Figure 12.1 depicts a very tame roller-coaster ride for NFL end-of-season balance. Taking a reasonable "worst balance" cutoff of 1.90, there was really only one episode of truly awful balance, the 6-year string 1924–1929 (RSD range 1.90–2.24). While there have been trouble spots, like the 3-year period 1941–1942 and 1944 (RSD range 1.99–2.29), balance has never been as bad as the 1920s. Indeed, grabbing a reasonable "best balance" cutoff of 1.50, the 1950s saw a 6-year period 1952 and 1954–1957 of best balance ever (RSD range 1.20–1.49). But there also was a 6-year streak of "best balance" 1978–1983 (RSD range 1.28–1.49) followed by a 3-year streak to end the 1980s, 1987–1989 (RSD range 1.35–1.44). Finally, there was a 7-year period of "best balance" that included another 6-year streak 1993–1997 and 1999 (RSD range 1.22–1.49). Thus, it would seem that all of the improvements

Table 12.1 RSD in the NFL by decade, 1920s–2000s

Decade	RSD	Balance rank	Year	RSD
1920s	1.96	9 (Worst)	2000	1.58
1930s	1.70	7	2001	1.63
1940s	1.85	8	2002	1.32
1950s	1.52	3	2003	1.54
1960s	1.69	6	2004	1.54
1970s	1.62	5	*Average*	*1.52*
1980s	1.47	1 (Best)	2005	1.69
1990s	1.51	2	2006	1.45
2000s	1.57	4	2007	1.66
			2008	1.66
			2009	1.61
			Average	*1.61*
			2010	1.50

Source: Calculated from Appendix 1

in end-of-season balance occurred first in the 1950s. This is made a bit clearer in Table 12.1, RSD by decade (made popular by Quirk and Fort 1992) and annually for the last decade.

Again, it is clear that the last 3 decades have been the best in NFL history, on a par with that original balance improvement in the 1950s. From Table 12.1, the 2000s average RSD = 1.57. That ranks the 2000s as fourth best decade of nine in terms of end-of-season balance and only misses being the most balanced observed decade (1980s) by 6.8%. At least based on decade averages, any claim that end-of-season balance changed in any perceptible way at all during the decade of the 2000s is not born out by the data. Indeed, in the decade of the 2000s, RSD varied around the mean of 1.57 by less than 8.3% at the best (1.45 in 2006) and 5.7% at the worst (1.66 in either 2007 or 2008) and the worst is not even close to the worst that has happened in the modern NFL (1.88 in 1975 and 1976).

Also clear in Table 12.1 is that the merger was important for end-of-season balance. This surely had to happen since merger brings some strong teams into the league and, apparently, the rest of the old AFL teams weren't that bad either. The 1-decade pre- and post-merger comparison is just a 4% improvement from the 1960s to the 1970s. However, the average RSD comparison is 1.70 for the 41 years prior to 1970 to 1.51 for the 41 years since 1970, a 9.5% improvement in balance. Even decade-by-decade in Table 12.1, one can describe a pretty constant and historically high level of balance on average until the 2000s. RSD at the decade average has never returned to its premerger levels. Most recently through the 2000s perhaps there is cause for concern about end-of-season balance. RSD for the first 5 years averaged 1.52 and then 1.61 for the second 5 years, a decline in balance of about 6%. But with variations in the ±4% range, this does not really seem like that big of a deal and the first indication for the current decade is an increase in balance back to the level enjoyed in the early 2000s (RSD = 1.50 for 2010). Further, while balance worsened a bit in the latter half of the decade, there are never any single years that look anything like the worse periods of imbalance prior to the merger.

Just for fun, what went on with that observed awful stretch of imbalance, 1924–1929? The answer is that the distribution of winning percents ends up to be extremely leptokurtotic in these years (heavy in the tails relative to the mean of 0.500). The number of teams changed from as many as 22 in 1926 to 12 in 1929 but nearly none of these teams were actually in the area of 0.500; 5/19 in 1924, 2/20 in 1925, 2/22 in 1926, 0/12 in 1927, 1/10 in 1928, and 2/12 in 1929. The tails were simply overpopulated so that, once upon a time in the NFL, there truly were "haves" and "have-nots."

By way of comparison, Fort (2011, p. 168) reports RSD values for the major pro sports leagues by decade. For the 2000s, he shows that the other pro sports leagues pale by comparison. Ranked by RSD values in the decade of the 2000s, the NFL is followed by the National League in baseball (RSD = 1.68), the NHL (RSD = 1.71), the American League in baseball (RSD = 2.05), and the NBA (RSD = 2.64). A clear conclusion is that the NFL has pretty steady balance, especially through the decade of the 2000s, and much more balanced than any of the remaining pro sports leagues. (Interestingly, in a book manuscript in preparation, I find that the "equity" college football conferences (ACC, Big 12, Big East, Big Ten, Pac 10, and SEC) are even more balanced than the NFL in terms of their regular season ending winning percents).

The obvious shortcoming of stopping here is that RSD could be quite close to unity so that league play could be very close but still crown the same champion year in and year out. I address access to the playoffs next and championship outcomes (dynasties) follow easily enough after that. Relationships between the various balance measures and policy choices by the NFL are saved for the penultimate section of the paper.

12.3 Access to the Playoffs

Appendix 2 contains all Conference Championship matchups in the playoffs for the modern NFL. It is, of course, arbitrary to choose the conference level to investigate, but it has a couple of virtues. First, the choice escapes the one-game tie playoffs that occurred in the old NFL (prior to 1970). Second, it sets the bar a bit higher than just getting to the wild card round or competing for the division title. I choose to measure access by turnover year to year in the teams that make it to the playoffs. Of course, this stops short of success through the playoffs, but that progression leads neatly to the next section on championship outcomes.

The results are plotted in Fig. 12.2, showing the number of non-repeat teams from the year before. In addition, since we could have 100% turnover from year to year by the same sets of teams, repeatedly, I also note the average number of years between appearances for those teams playing for the Conference Championship. Figure 12.2 contains some interesting results. First, the most frequent outcome is four new teams pursuing the Conference Championship (nine different seasons and 3 times in a row 1999–2001). Second, there has never been an occurrence where all

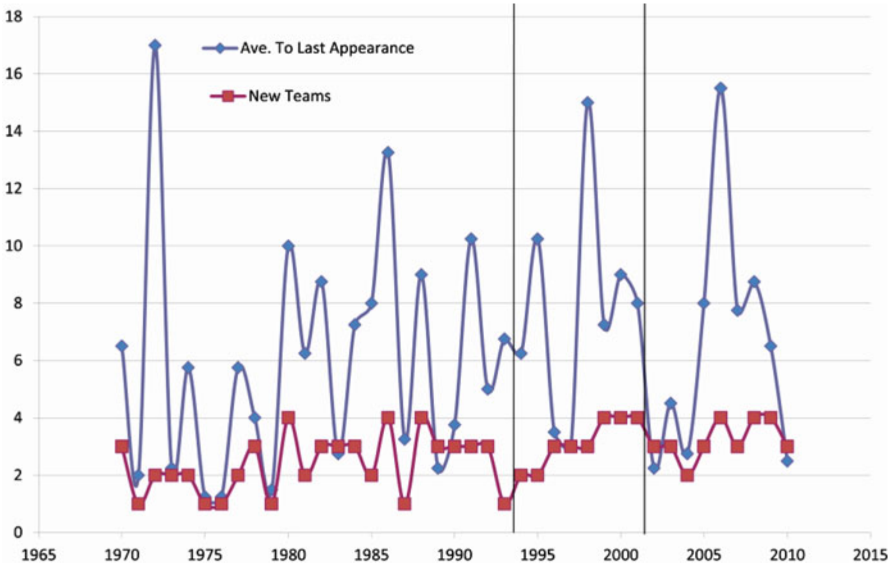

Fig. 12.2 Average time to last appearance and number of new teams, NFL Conference Championship Participants, Modern NFL (1970–2010) (Criterion: Reasonable chance of winning their division). *Source*: Appendix 2

four teams repeated from one season to the next. Indeed, three teams repeating have happened only 6 times in the modern NFL, 14.6% of the chances. There are five episodes where there was an equal turnover for three or more years in a row, and most often that involved three teams. For me, this doesn't show any other conclusion except that there is hefty turnover annually. This conclusion is bolstered by the average number of years to the last playoff in Fig. 12.2. Nearly all of the numbers are large rather than small (2 years or less, for example). The reader will note from the Appendix that the years with truly large values for the average years to last appearance occur when teams that had never made to the playoffs before finally made it, Atlanta in 1998 and New Orleans in 2006.

Lest we think that this type of access is new, let's remember back to our worst-ever end-of-season balance episode, 1924–1929. Even though highly imbalanced with nearly no teams clustered around the mean of 0.500, six different teams won the NFL championship in those years (Cleveland Bulldogs, Chicago Cardinals, Frankford Yellow Jackets, New York Giants, Providence Steam Rollers, and Green Bay Packers). It sure does appear that the NFL is quite balanced in terms of playoff access except for a very few bottom dwellers who appear quite hopeless.

The two nearly identical Matterhorn rides with a peak of 15 years in 1998 and then a peak of 15.5 years in 2006 give the impression of a possible cycle that would signal a longer-term repetitiveness in access to the Conference Championship. However, in 1998, it was Denver, Atlanta, the New York Jets, and Minnesota with the Falcons breaking their franchise-long drought begun in 1966 and then in 2006

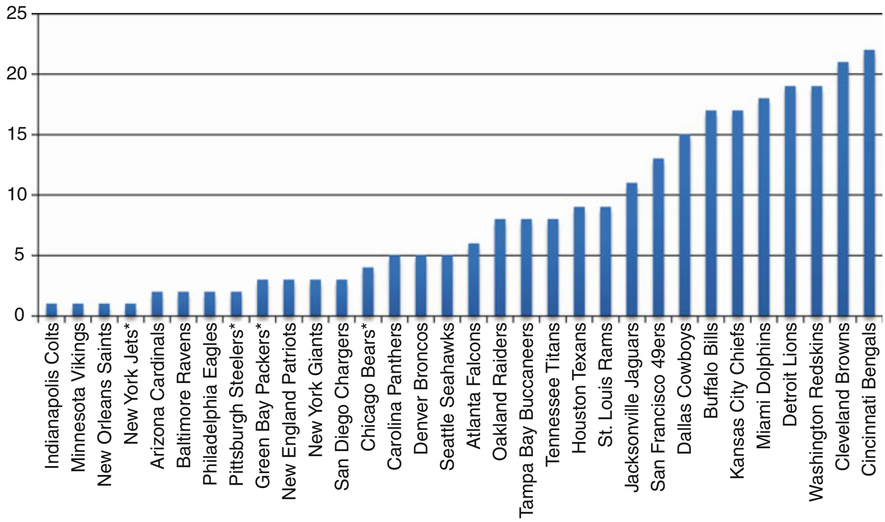

Fig. 12.3 Conference Championship apperance droughts, 2010. *Note*: *Asterisks* denotes 2010 Conference Championship participant

it was Chicago, Indianapolis, New Orleans, and New England with the Saints breaking their franchise-long drought that started in 1967. To be a true cycle it should involve the same teams rather than different teams so all we get is that in these episodes a long drought was broken. But that brings us to an important point about balance. Active turnover could still only be among some, but not all, of the NFL teams. Perhaps there are simply some teams with no hope.

As they entered the 2010 playoffs, Conference Championship droughts by team are in Fig. 12.3. The average drought is 8.2 years. Oakland, Tampa Bay, and Tennessee all sit at the average. More importantly, the median drought is 5.5 years indicating quite a skewed distribution of droughts. The average drought for those below the median is 2.7 years and the four tail occupants (Colts, Vikings, Saints, and Jets) all have droughts of 1 year. The average drought for those above the median is 13.75 years and the worst droughts are Cincinnati (22 years), Cleveland (21 years), Washington (19 years), and Detroit (19 years). This concentration of long droughts (and very short ones) does indicate hopelessness for the fans of a few teams even though there appears to be high-level access among the rest of the teams.

12.4 Conference Championship and Super Bowl Outcomes

In the modern NFL there were 15 or 16 teams in each conference, so an equalized outcome would have teams winning their Conference Championship every 15 or 16 years. Table 12.2 shows nothing could be further from the truth for Conference Champions in the modern NFL. In the AFC, Pittsburgh, Denver, and

Table 12.2 Years to conference championship in the modern NFL, 1970–2010

Team	First	Last	Years	Conference Championship	Years/ appearance
AFC					
Pit	1970	2010	41	8	5.1
Den	1970	2010	41	6	6.8
NE	1970	2010	41	6	6.8
Mia	1970	2010	41	5	8.2
Oak	1970–1981	1995–2010	28	3	9.3
Buf	1970	2010	41	4	10.3
LARaid	1982	1994	13	1	13.0
Ind	1984	2010	27	2	13.5
BalColts	1970	1983	14	1	14.0
Ten	1997	2010	14	1	14.0
BalRavens	1996	2010	15	1	15.0
Cin	1970	2010	41	2	20.5
SD	1970	2010	41	1	41.0
HouOil	1970	1996	27	0	–
HouTexans	2002	2010	9	0	–
Jax	1995	2010	16	0	–
KC	1970	2010	41	0	–
NYJ	1970	2010	41	0	–
NFC					
Dal	1970	2010	41	8	5.1
SF	1970	2010	41	5	8.2
Was	1970	2010	41	5	8.2
NYG	1970	2010	41	4	10.3
GB	1970	2010	41	3	13.7
Min	1970	2010	41	3	13.7
Carol	1995	2010	16	1	16.0
StL	1970–1987	1995–2010	34	2	17.0
Chic	1970	2010	41	2	20.5
Phil	1970	2010	41	2	20.5
Ariz	1988	2010	23	1	23.0
LARams	1970	1994	25	1	25.0
Atl	1970	2010	41	1	41.0
NO	1970	2010	41	1	41.0
Sea	1970	2010	41	1	41.0
TB	1970	2010	41	1	41.0
Cle	1970–1995	1999–2010	38	0	–
Det	1970	2010	41	0	–

Source: http://pro-football-reference.com

New England simply rule the championship (with Miami and Oakland not far behind) overall. By decade, it's Pittsburgh in the 1970s (4), Denver in the 1980s (3), Buffalo in the 1990s (4), and New England in the 2000s (4). In the NFC, similar overall dominance occurs by Dallas, San Francisco, and Washington. Decade-by-decade, it is Dallas in the 1970s (5), San Francisco in the 1980s (4), Dallas again in the 1990s (3), and New York in the 2000s (2). In the last 2 decades things are little bit more even—the NFC compared to the AFC and the NFC has witnessed a steady decline in concentration in every decade of the modern NFL. Looking any further moves on to the question of dynasties.

Of course, that then raises the question of just what is a dynasty in the NFL? If it is Conference Champion dynasties, it seems safe to say they exist in every decade in the AFC but that the chance at a dynasty has declined each decade in the NFC to the point where there wasn't one in the 2000s. Appendix 2 also puts an asterisk on the Conference Champion that lost the Super Bowl and a double asterisk on the eventual NFL Champion. Sticking just with the modern NFL, the AFC has won 19 Super Bowls while the NFC has won 22. Indeed the NFC ran off a 13-year streak against the AFC from the 1985 game to the 1997 game. Interestingly, things have taken a turn toward the AFC since then with that conference winning 9 of the last 14 games. However, at the individual team level there has never been anything beyond back-to-back NFL Champions (Miami 1973–1974, Pittsburgh 1975–1976 and 1979–1980, Denver 1998–1999, New England 2004–2005 in the AFC; San Francisco 1989–1990 and Dallas 1993–1994 in the NFC). Thus, across the years, it is tough to say there is any such thing as an NFL Champion dynasty.

But this is probably no solace to the two teams that have yet to even appear in the Super Bowl in the history of the modern NFL, namely, the Jets (43 years actually back to premerger days) and the Chiefs (42 years, again back to premerger days). The remaining longest Super Bowl appearance droughts are the Vikings 34 years, Dolphins 26 years, Bengals 22 years, and four more teams between 15 and 20 years (Washington, Buffalo, San Diego, and San Francisco). So clearly there is concentration in the Super Bowl, but it falls short of any reasonable definition of "dynasty."

12.5 Policy Insights

The main league choices typically thought to have had an impact on competitive balance in the NFL are the merger after the 1969 season, playoff alterations in 1978 (add two wild card teams) and again in 1990 (four wild card teams), the payroll cap for 1993, free agency for 1994, and shifting from simple gate revenue sharing to pooled sharing in 2001. I examine each of these in what follows.

12.5.1 Merger

Merger should improve balance since the number of "best" teams is roughly doubled initially. For end-of-season measured by RSD, above, clearly balance improved by decade in Table 12.1. Fort and Lee (2007), examining a variety of measures including RSD over the entire history of the NFL found a structural break for 1969. Thus, it seems pretty clear that the merger improved end-of-season competitive balance.

12.5.2 Wild Card Teams

Allowing increased access should reduce the chances that the best teams make it through the playoffs, but not anywhere near to below 50% (Fort and Quirk 1995). The interesting years here are 1978 (two wild care teams) and 1990 (four wild card teams) and care must be exercised for 1982 when the NFL chose eight wild card teams for a bit more of a round-robin feel in that strike-shortened year. Since this is all about the playoffs, let's just look at Conference Championship access and Conference Champions. For the former, the number of new teams did increase by about one team on average comparing 1970–1977 to 1978–1985. However, the average number of years to last appearance also increased by almost 1 year. And clearly nothing happened of importance for final champions, conference, or Super Bowl, in the years around 1978. As for increasing the number of Wild Card teams in 1990, maybe the continual decline in access streaks to the Conference Championship in the NFC is tied to this change. However, that leaves us wondering why not in the AFC? Perhaps more knowledgeable historians will find an answer.

12.5.3 Payroll Cap and Free Agency

The NFL payroll cap was imposed in 1993 and the modern version of free agency right after that for 1994. A payroll cap can improve balance but it must be both free of loopholes and vigorously enforced since caps create an enforcement problem (Fort and Quirk 1995). I cover in my textbook (Fort 2011, Chapter 6) that payrolls in the NFL have never remotely approached the official cap. While it is clear that NFL cap has never been a "hard" cap, so that its impact on competitive balance would be mitigated, it cannot be determined whether enforcement played a role. Free agency, under Rottenberg's (1956) invariance principle should have no impact on balance at all.

Examining episodes before 1993 and from then on, we see the following. For end-of-season balance, the average RSD 1988–1992 is 1.56 while the average RSD 1993–1997 is 1.37, a 12.4% improvement. Average years to last appearance in the Conference Championship declined but in an insignificant way (6.05 to 5.95 years). I find nothing interesting in Appendix 2 in the way of either conference or Super Bowl champions that coincides with the imposition of the payroll cap and free agency. All in all, this type of significant but small impact would go along with the expectations of a weak payroll cap.

12.5.4 Revenue Sharing

A version of the invariance principle for the case of revenue sharing appears in Quirk and Fort (1992) and Fort and Quirk (1995) and is sketched out in Fort (2011). The economic intuition is quite straightforward. In equilibrium, the marginal value of talent is equal across all team owners. Equality at the margin is not impacted at all by changing the value of talent at the margin equally across all owners. All that happens is the value of talent falls the same amount at the margin, owners keep money that otherwise would have gone to players, and then share it among themselves according to the revenue sharing formula. Under pooled sharing, Dallas does not write a check to Kansas City. Instead, both owners take money from players and Dallas takes a somewhat smaller net share of the proceeds than does Kansas City. This won't change balance one iota.

Examining the data again, this time centered on the move to pooled sharing in 2001, the following stand out. First, end-of-season balance measured by RSD did not change at all (literally) in the 5 years from 2001 on compared to the 5 years prior to that. For Conference Championship access, the average number of years to last appearance actually fell from 7.55 to 5.1 years, a significant decline of about 14.3%. And surely nothing improved about concentration of the conference and Super Bowl champions. As the theory suggests, revenue sharing did not improve competitive balance in the NFL.

12.6 Other End-of-Season Insights

So, with the exception of the merger, and a small improvement that coincides with the imposition of the payroll cap, none of the policy choices by the league really did anything. For end-of-season balance, the aforementioned, more technical examination of the competitive balance time series in the NFL by Fort and Lee (2007) does lend a bit more insight. We discovered that there has been no significant trend in end-of-season balance in the NFL at all once structural breaks in the data are taken into account. We found those breaks in 1969 and 1976–1977 and both breaks were associated with improved balance with no trend before or after the breaks. In addition, we noted that cable TV can't have an impact because of national sharing only in the NFL; substantial rule changes should put weaker defensive teams in the running and improve balance; expansion into New Orleans in 1967 should reduce balance; Boston's adoption of a regional fan base as the NE Patriots should aid balance; and there is no economic intuition about how the official recognition of the NFLPA in 1968 would impact balance. We found that most of this is a wash except for the merger and official recognition of the union. Since balance improved, either union recognition also enhances balance or the merger impacts were stronger. The added insight about 1976–1977 was as follows. First, balance shifted to an improvement but then had no trend at all after that. There was expansion in 1976 to Seattle and Tampa Bay that should reduce balance and a 42-day training camp strike in 1974 without any season games missed. Why this would coincide with an improvement in balance eluded us then and it still eludes me now. We also commented on one other non-result. The draft was in place since the origination of the league in 1922 but it did change from a geographical draft to a reverse-order-of-finish draft shortly thereafter but this apparently had no effect on balance. This is consistent with Rottenberg's invariance principle.

12.7 Conclusions

Rottenberg's story about outcome uncertainty makes balance the subject of management by the team owners that comprise the management entity we know as the NFL. Various ideas float around about the NFL as the poster child of balance and that somehow this is the result of careful, wise management. Indeed, the only real worry seems to be more about whether the NFL is too balanced, removing the incentive to invest heavily in the best talent. This end-around on Rottenberg would then have it that if league policy choices force "too much" balance, why would owners meet the rules with a more expensive rather than less expensive lineup? The empirical implication is that the absolute level of talent should decline while the relative level of talent remains pretty much equal across the league.

These fears seem groundless since I doubt there is anybody anywhere who would argue that somehow the absolute level of talent in the NFL has fallen. This is obvious on the face of it given the athleticism, size, and power increases in players over the years. I point out elsewhere the details (Fort 2008) but the average size of the Super Bowl offensive line increased from 245 lb (Green Bay, 1967) to 302 lb (Indianapolis, 2008), or 23% in roughly 40 years. The largest offensive lineman in this comparison increased from 249 lb (Forrest Gregg) to 342 lb (Tarik Glenn), or 37% (they were about the same height, 6 ft 5 in.). It is also obvious economically since the NFL continues to accrue ever increasing and pretty massive revenues, upward of $9 billion by popular reports for 2011.

I think it is safe to say that the prominent belief is that the NFL's (enviable according to some observers) level of balance is the result of careful and insightful management by the league. However, the data seem to show that, except for the merger and perhaps the payroll cap early on, none of the policy choices by the league have coincided with any improvement in balance. This suggests, instead, that either balance appears not to be much of a goal, or the NFL is simply awful at trying to enhance it, or there are other motives behind the actual mechanisms used to enhance balance. The latter has some support since it is accepted theory that revenue sharing, for example, actually reallocates money from players to owners to be shared according to their agreed upon revenue sharing rule.

Nonetheless, the league has always been and continues to be the most balanced of all pro leagues begging the question why. One explanation and another hypothesis occur to me. The explanation part is the rest of what would cause balanced talent allocation, namely, that the markets in the NFL are that much more balanced in terms of willingness to pay than the markets in other sports. There is some intuitive support for this since fans in Green Bay appear not to behave much differently in their willingness to pay than fans in New York. Whatever it is in Green Bay (lack of substitutes or just plain frenzy), they are just as loyal and send just about as much of their money to the Packers before revenue sharing.

The hypothesis, on the other hand, is that there is just something different about the actual play of the games that means more balanced outcomes in football. The obvious difference is just season length. Perhaps there is something about an eight home game season that generates different choices by owners and coaches than the choices made by owners and coaches with 41–81 home game seasons. In any event, sports economics is far from complete in its investigation of competitive balance.

12.8 Appendix 1: NFL RSD, 1922–2010

Year	ASD	*N*	ISD	RSD	Year	ASD	*N*	ISD	RSD
1922	0.30	9	0.17	1.82	1957	0.17	12	0.14	1.20
1923	0.30	8	0.18	1.71	1958	0.25	12	0.14	1.71
1924	0.31	10	0.16	1.95	1959	0.23	12	0.14	1.57
1925	0.31	10	0.16	1.97	*Average*				*1.52*
1926	0.29	12	0.14	2.00	1960	0.23	12	0.14	1.57
1927	0.29	11	0.15	1.93	1961	0.21	14	0.13	1.58
1928	0.30	12	0.14	2.09	1962	0.25	14	0.13	1.90
1929	0.31	13	0.14	2.24	1963	0.25	14	0.13	1.88
Average				*1.96*	1964	0.21	14	0.13	1.54
1930	0.24	12	0.14	1.68	1965	0.19	14	0.13	1.41
1931	0.25	12	0.14	1.75	1966	0.21	14	0.13	1.57
1932	0.26	12	0.14	1.83	1967	0.23	14	0.13	1.73
1933	0.22	11	0.15	1.45	1968	0.25	14	0.13	1.85
1934	0.27	11	0.15	1.79	1969	0.25	14	0.13	1.84
1935	0.22	12	0.14	1.49	*Average*				*1.69*
1936	0.26	12	0.14	1.81	1970	0.22	14	0.13	1.61
1937	0.26	11	0.15	1.70	1971	0.19	14	0.13	1.46
1938	0.21	11	0.15	1.42	1972	0.23	14	0.13	1.70
1939	0.32	11	0.15	2.10	1973	0.23	14	0.13	1.74
Average				*1.70*	1974	0.20	14	0.13	1.48
1940	0.25	11	0.15	1.65	1975	0.25	14	0.13	1.88
1941	0.30	11	0.15	1.99	1976	0.25	14	0.13	1.88
1942	0.33	11	0.15	2.19	1977	0.21	16	0.13	1.70
1943	0.28	10	0.16	1.80	1978	0.17	16	0.13	1.38
1944	0.36	10	0.16	2.29	1979	0.17	16	0.13	1.39
1945	0.28	10	0.16	1.75	*Average*				*1.62*
1946	0.21	11	0.15	1.40	1980	0.19	16	0.13	1.49
1947	0.20	12	0.14	1.36	1981	0.17	16	0.13	1.39
1948	0.28	12	0.14	1.91	1982	0.21	9	0.17	1.28
1949	0.27	16	0.13	2.16	1983	0.17	16	0.13	1.40
Average				*1.85*	1984	0.21	16	0.13	1.68
1950	0.25	12	0.14	1.70	1985	0.21	16	0.13	1.64
1951	0.25	12	0.14	1.73	1986	0.21	16	0.13	1.67
1952	0.19	12	0.14	1.35	1987	0.17	15	0.13	1.35
1953	0.28	12	0.14	1.94	1988	0.17	16	0.13	1.35
1954	0.21	12	0.14	1.49	1989	0.18	16	0.13	1.44
1955	0.18	12	0.14	1.27	*Average*				*1.47*
1956	0.18	12	0.14	1.24	1990	0.20	16	0.13	1.62

(continued)

Year	ASD	N	ISD	RSD	Year	ASD	N	ISD	RSD
1991	0.22	16	0.13	1.74	1996	0.18	16	0.13	1.47
1992	0.21	16	0.13	1.65	1997	0.18	16	0.13	1.46
1993	0.16	16	0.13	1.28	1998	0.21	16	0.13	1.71
1994	0.18	16	0.13	1.40	1999	0.19	16	0.13	1.49
1993	0.16	16	0.13	1.28	*Average*				*1.51*
1994	0.18	16	0.13	1.40	2000	0.20	16	0.13	1.58
1993	0.16	16	0.13	1.28	2001	0.20	16	0.13	1.63
1994	0.18	16	0.13	1.40	2002	0.17	16	0.13	1.32
1993	0.16	16	0.13	1.28	2003	0.19	16	0.13	1.54
1994	0.18	16	0.13	1.40	2004	0.19	16	0.13	1.54
1993	0.16	16	0.13	1.28	2005	0.21	16	0.13	1.69
1994	0.18	16	0.13	1.40	2006	0.18	16	0.13	1.45
1993	0.16	16	0.13	1.28	2007	0.21	16	0.13	1.66
1994	0.18	16	0.13	1.40	2008	0.21	16	0.13	1.66
1993	0.16	16	0.13	1.28	2009	0.20	16	0.13	1.61
1994	0.18	16	0.13	1.40	*Average*				*1.57*
1995	0.15	16	0.13	1.22	2010	0.19	16	0.13	1.50

Source: Rod's Sports Data, http://www.rodneyfort.com

12.9 Appendix 2: NFL Conference Playoff Teams, 1970–2010

Year	Teams	Last appearance	Year	Teams	Last appearance
1970	BalColts[b]	1968	1973	Mia[b]	1972
	Dal[a]	1967		Min[a]	1969
	Oak	1969		Oak	1970
	SF	First time		Dal	1972
	Average years W/O	6.5		Average years W/O	2.25
	New teams	3		New teams	2
1971	Dal[b]	1970	1974	Min[a]	1973
	Mia[a]	First time		Pit[b]	1972
	SF	1970		LARams	1955
	BalColts	1970		Oak	1973
	Average years W/O	2		Average years W/O	5.75
	New teams	1		New teams	2
1972	Mia[b]	1971	1975	Dal[a]	1973
	Was[a]	1945		Pit[b]	1974
	Pit	First time		LARams	1974
	Dal	1971		Oak	1974
	Average years W/O	17		Average years W/O	1.25
	New teams	2		New teams	1

(continued)

Year	Teams	Last appearance	Year	Teams	Last appearance
1976	Min[a]	1974	1983	LARaiders[b]	First time
	Oak[b]	1975		Was[a]	1982
	LARams	1975		Sea	First time
	Pit	1975		SF	1981
	Average years W/O	1.25		Average years W/O	2.75
	New teams	1		New teams	3
1977	Dal[b]	1973	1984	Mia[a]	1982
	Den[a]	First time		SF[b]	1983
	Min	1976		Pit	1979
	Oak	1976		Chi	1963
	Average years W/O	5.75		Average years W/O	7.25
	New teams	2		New teams	3
1978	Dal[a]	1977	1985	Chi[b]	1984
	Pit[b]	1976		NE[a]	1963
	LARams	1976		LARams	1979
	HouOilers	1967		Mia	1982
	Average years W/O	4		Average years W/O	8
	New teams	3		New teams	2
1979	Pit[b]	1978	1986	Den[a]	1977
	LARams[a]	1978		NYG[b]	1963
	HouOilers	1978		Cle	1969
	TB	First time		Was	1982
	Average years W/O	1.5		Average years W/O	13.25
	New teams	1		New teams	4
1980	Phil[a]	1960	1987	Den[a]	1986
	Oak[b]	1977		Was[b]	1986
	Dal	1978		Cle	1986
	SD	1965		Min	1977
	Average years W/O	10		Average years W/O	3.25
	New teams	4		New teams	1
1981	Cin[a]	First time	1988	Cin[a]	1981
	SF[b]	1971		SF[b]	1984
	SD	1980		Buf	1966
	Dal	1980		Chi	1985
	Average years W/O	6.25		Average years W/O	9
	New teams	2		New teams	4
1982	Was[b]	1972	1989	Den[a]	1987
	Mia[a]	1972		SF[b]	1988
	Dal	1980		Cle	1987
	NYJ	1969		LARams	1985
	Average years W/O	8.75		Average years W/O	2.25
	New teams	3		New teams	3

(continued)

Year	Teams	Last appearance	Year	Teams	Last appearance
1990	Buf[a]	1988	1997	GB[a]	1996
	NYG[b]	1986		Den[b]	1991
	LARaiders	First time		SF	1994
	SF	1989		Pit	1995
	Average years W/O	3.75		Average years W/O	3
	New teams	3		New teams	3
1991	Buf[a]	1990	1998	Den[b]	1997
	Was[b]	1987		Atl[a]	First time
	Den	1989		NYJ	1982
	Det	1957		Min	1987
	Average years W/O	10.25		Average years W/O	15
	New teams	3		New teams	3
1992	Dal[b]	1982	1999	StLRams[b]	First time
	Buf[a]	1991		Ten[a]	First time
	SF	1990		TB	1979
	Mia	1985		Jax	1996
	Average years W/O	5		Average years W/O	7.25
	New teams	3		New teams	4
1993	Dal[b]	1992	2000	NYG[a]	1990
	Buf[a]	1992		BalRavens[b]	First time
	SF	1992		Min	1998
	KC	1969		Oak	1980
	Average years W/O	6.75		Average years W/O	9
	New teams	1		New teams	4
1994	SD[a]	1981	2001	NE[b]	1996
	SF[b]	1993		StLRams[a]	1999
	Pit	1984		Pit	1997
	Dal	1993		Phil	1980
	Average years W/O	6.25		Average years W/O	8
	New teams	2		New teams	4
1995	Pit[a]	1994	2002	Oak[a]	2000
	Dal[b]	1994		TB[b]	1999
	Ind	First time		Ten	1999
	GB	1967		Phil	2001
	Average years W/O	10.25		Average years W/O	2.25
	New teams	2		New teams	3
1996	GB[b]	1995	2003	NE[b]	2001
	NE[a]	1985		Carol[a]	1996
	Carol	First time		Ind	1995
	Jax	First time		Phil	2002
	Average years W/O	3.5		Average years W/O	4.5
	New teams	3		New teams	3

(continued)

Year	Teams	Last appearance	Year	Teams	Last appearance
2004	NE[b]	2003	2008	Pit[b]	2005
	Phil[a]	2003		Ariz[a]	First time
	Pit	2001		BalRavens	2000
	Atl	1998		Phil	2004
	Average years W/O	2.75		Average years W/O	8.75
	New teams	2		New teams	4
2005	Sea[a]	1983	2009	NO[b]	2006
	Pit[b]	2004		Ind[a]	2006
	Carol	2003		Min	2000
	Den	1998		NYJ	1998
	Average years W/O	8		Average years W/O	6.5
	New teams	3		New teams	4
2006	Chi[a]	1988	2010	Pit[a]	2008
	Ind[b]	2003		GB[b]	2007
	NO	First time		NYJ	2009
	NE	2004		Chi	2006
	Average years W/O	15.5		Average years W/O	2.5
	New teams	4		New teams	3
2007	NE[a]	2006			
	NYG[b]	2000			
	SD	1994			
	GB	1997			
	Average years W/O	7.75			
	New teams	3			

Source: Data from http://pro-football-reference.com.
Note: SF began play in 1950. Miami entered the AFL in 1966. Pittsburgh appears for the first time in 1933 as the Pirates, Steelers in 1940. Denver was an original AFL team in 1960. TB expansion team 1976 along with Sea. Cin AFL expansion team 1968. LARaiders began play in 1982. Indianapolis began play in 1984. Atlanta began play in 1966. St. Louis Rams began play in 1995. Tennessee began play in 1997. Baltimore Ravens began play in 1996. Raiders moved to LA in 1982 and back to Oakland in 1995. New Orleand began play in 1967. Phoenix/Arizona Cardinals began play in 1988. Houston Texans are the only modern NFL team to not make the playoffs. They play in 2002 and have gone the entire 9 years without an appearance.
[a]Super Bowl loser.
[b]Super Bowl winner.

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Chapter 13
Gambling and the NFL

Rodney Paul, Robert Simmons, and Andrew Weinbach

13.1 Introduction

For better or worse, depending upon one's point of view, there exists a strong and natural tie between the National Football League (NFL) and betting markets. Wagering on NFL games has become synonymous with Sundays and Monday nights during the fall throughout the USA. Millions of bettors, whether legally in Nevada, pseudolegally in offshore sportsbooks, or illegally through local outlets, find their way to betting windows, Internet connections, or phone calls to the town bookie to place their wagers on the weekly action in the NFL.

There are likely many reasons that bettors are attracted to NFL games as the thrill of winning money, the major event status that the NFL has in modern life, and the bragging rights that come with correctly picking winners all tend to attract people from all areas of life to wager on football games. One reason that cannot be overstated is the feeling of personal investment in a game when one places a wager. Whether this wager is on the person's local team, their childhood favorite team, the most popular teams in the league, against the perceived worst teams in the league, or even just the thrill of trying to pick the winners in the televised games, when actual dollars are at stake, the experience of watching the NFL takes on a whole new meaning. Bettors win or lose as their backed team sees success or failure. Not only does an underperforming team feels the losses at the team level but their bettors (financial backers) also suffer financial losses to the bookmaker. On the contrary, as

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winning teams celebrate their success on the field, and bettors share in the success of “their” team in the form of financial gains.

Whatever the underlying reasons for wagering might be for the multitudes of bettors who make their plays each weekend, NFL wagering dominates the betting activity through both legal and illegal channels in the USA. Billions of dollars are wagered each year on NFL games, with the Superbowl at the end of the season attracting $81.5 million in wagering at legal sportsbooks in Nevada, though this figure is estimated to be just 1.5% of total wagering when illegal betting is considered (based on American Gaming Association study). The sheer size of the NFL betting market alone would likely be enough to attract the attention of economists. However, given that this market has some attractive properties for academic researchers, in both the fields of Economics and Finance, the NFL betting market has become a popular and productive avenue for research, allowing for a betting understanding of participant activity within this market. The celebrated Finance theory of The Efficient Markets Hypothesis is directly testable using NFL betting data, with the critical advantage that NFL games have well-defined termination points in contrast to stock markets. This, along with the potential to better understand the utility functions of bettors as well as the application of prediction markets to forecast events beyond the interaction of bettors and bookmakers, has attracted researchers and led to important contributions to the literature, enhancing our understanding of this market and markets in general.

13.2 The Balanced Book Hypothesis

Before delving into the rationale behind and the findings of economic research from the NFL betting market, it is important to understand the underlying assumptions that allowed for the original studies of this market. The way the NFL betting market was thought of and the fundamental assumption made by the first researchers in this field centered upon the balanced book hypothesis. The notion of a balanced book is quite important to understanding what was assumed about sportsbook behavior. Likely more importantly, this assumption allowed for a link to studying The Efficient Markets Hypothesis of finance, when that hypothesis was traditionally only thought of as being studied through mainstream financial markets such as stocks and bonds.

The assumption of a balanced book supposes that the sportsbook, or bookie, will set a price in this financial market in an attempt to attract an equal amount of wagering dollars on each side of the betting proposition. Rather than using odds as the “price” mechanism, common in other sports, most NFL wagering is based on the point spread. The point spread is a value by which one team is favored over another. This means that the favorite team must win by more than the point spread for a favorite bettor to win their bet, while an underdog bettor will win if the underdog wins the game outright or if the favorite team wins by a smaller margin than the posted point spread. If a game has an outcome that is exactly equal to the point spread, where the favorite team wins by precisely that amount, the game is considered a “push” and all monies are returned to the bettor.

As bettors know, a point spread wager on the NFL is not a straight bet in the sense that a successful \$100 wager does not return the original \$100 plus \$100 in winnings. The 11 for 10 rule is customary and used by virtually all legal Nevada sportsbooks and illegal bookmakers in the USA. Based on this rule, a bettor must wager \$110 on his chosen side of the proposition to win \$100. Most online sportsbooks (located outside of the USA) catering to North American NFL bettors also use the 11 for 10 rule, though some online sportsbooks offer more favorable betting lines, with vigorish reduced to \$108 or \$107, with some sportsbooks even offering, specials for Friday bettors of \$105 or even vigorish free wagers (bet \$100 to win \$100) on certain games to attract new clients.

The expression "vig" is the short version of the word "vigorish," which is the commission that must be paid by bettors when they wish to wager through a bookie. The "juice" or the "hook" are other phrases which are also used to denote that bettors must wager more than they will actually win back on their bets, with the amount typically being 10% under the 11-for-10 rule. The commission on bets allows for bookmakers to earn money for the services they offer, apart from any gains or losses they might accrue if/when they take actual positions in the betting market. The act of providing a service for bettors as "investors" and the fact that the sportsbook charges a commission secures an easy link to others who service financial industries, specifically, brokers.

Understanding the general earnings of brokers is important to understanding the original assumptions made about running a sportsbook. Whereas the broker makes his money by taking a commission on all transactions (such as purchases or sales of stocks or other financial instruments), the sportsbook is assumed to make its money through the commission it captures on losing bets. In short, both the broker and the bookie earn profits based upon volume: the number of transactions for the broker and the number of bets for the bookie.

The balanced book hypothesis stipulates that if the bookie sets a price which will capture an equal amount of money wagered on each side of the proposition, the sportsbook will capture its earnings without taking on risk associated with the game outcome. The way this works is that if the money is equalized on both the favorite and the underdog, no matter which side wins the game, the sportsbook will transfer the winnings from the losing bettors to the winning bettors and keep the commission on the losing bets as earnings. For instance, if a Las Vegas sportsbook has 1.1 Million dollars wagered on both the favorite and the underdog, it will earn a commission of \$100,000, regardless if the favorite or underdog wins the game, as \$1 Million is transferred from bettors to bettors and the remainder is kept by the sportsbook in exchange for offering the betting service.

This assumption about the sportsbook dispels the bettor myth that he/she is wagering against the bookie. If the balanced book assumption is met, bettors are really just wagering against bettors on the opposite side of the proposition and the sportsbook merely facilitates this transaction, earning greater revenues as the volume of money wagered increases. It is not always this simple, as even famed sportsbook operator and originator of the consulting group Las Vegas Sports Consultants, Roxy Roxborough notes, as balanced betting might be the goal in theory, but it seldom happens in practice. Imbalances in betting action and/or new information can lead to point spread movements (which mimic movements of prices in stock and bond markets), which complicate the story and we discuss their implications and findings of research based on NFL points pread movements later in this chapter.

With the simplifying assumption that by the time of market close, the closing point spread includes all available information on the game and the point spread was set to balance the betting dollars equally between the favorite and the underdog, the link to studying market efficiency becomes apparent. If the price which balances the betting dollars also offers an optimal and unbiased forecast of the outcome of the game, this provides strong evidence in support of the Efficient Markets Hypothesis, which states that all available information is included in the current price of a financial asset. If all of these assumptions are met and the point spread serves as an optimal and unbiased forecast of the final score differential in NFL games, the null hypothesis of efficient markets should not be rejected. This result is important in that it demonstrates the power of a simple and general theory. This was the focus of the earliest major studies in the academic literature.

In practice, the literature on the efficient market hypothesis splits into two parts: a Weak Form and a Strong Form. Under the Weak Form hypothesis, bookmakers' point spreads are best, linear unbiased predictors of the actual point spreads (margin of victory) for individual games. Using the notation of PB for bookmaker point spread, PA for actual point spread and ε for an error term, the weak form test of efficient NFL betting markets is given by the joint hypothesis of $\beta_0 = 0$ and $\beta_1 = 1$ in an ordinary least squares regression of

$$\text{PA} = \beta_0 + \beta_1 \text{PB} + \varepsilon. \tag{13.1}$$

An extended version of this equation was proposed by Golec and Tamarkin (1991) to distinguish between biases in favor or against the home team:

$$\text{PA} = \beta_0 + \beta_1 \text{PB} + \beta_2 H + \beta_3 F + \varepsilon. \tag{13.2}$$

Here, H is a dummy variable denoting home team, while F is a dummy variable denoting favorite. The weak-form test for market efficiency then becomes $\beta_0 = \beta_2 + \beta_3 = 0$ and $\beta_1 = 1$. Golec and Tamarkin found from a sample of games over 1973 to 1987 that bettors underestimated home field advantage and overestimated favorite status. This underdog bias grew over time through their sample, an interesting precursor to the argument concerning underdog bias that we present below.

Under the Semistrong Form Efficiency Hypothesis, betting odds or spreads fully incorporate all available public information. Under this hypothesis, bettors cannot obtain positive (abnormal) profits against bookmakers using a particular decision rule as a betting strategy. Hence, even if biases exist in the bookmakers' point spreads, these cannot be exploited to generate returns for bettors that are an improvement on the expected loss given by the bookmaker's commission or vigorish. The Strong Form Efficiency goes further still and states that betting spreads incorporate available *private* as well as public information.

13.3 First-Generation Studies of NFL Betting Markets

The first major academic study relating to NFL betting and market efficiency was performed by Pankoff (1968). Pankoff studied the NFL betting market from 1956 to 1965 and found the market to be efficient in the weak-form sense that the point spread represented an optimal and unbiased forecast of the outcome of the game. He notes that point spreads in the NFL betting market are akin to prices in the stock market, hence provide an opportunity to study the concept of market efficiency. Pankoff notes that it appears that some experts exist in the NFL betting market, but it is not obvious how they could exploit prices.

Vergin and Scriabin (1978) followed the study of Pankoff (1965). They studied the NFL betting market from 1969 to 1974 and found that a strategy of betting on underdogs was profitable, in violation of the Strong Form hypothesis. Favorites appeared overvalued in the sample, leading to a strategy of betting on underdogs winning enough to earn profits. In another study in the same journal, Tryfos et al. (1984) study a plethora of different betting strategies (70 total), in an attempt to find profitability in the NFL wagering market. They find evidence that past game outcomes do help to predict future outcomes, which allows for betting strategies that outperform expected returns. These winning strategies, however, are not great enough to overcome the commission on bets charged by the sportsbook.

Years later, these same strategies were studied again by Badarinathi and Kochman (1996) for the sample of 1984–1993. They search for profits using the same strategies developed in the previously mentioned *Management Science* studies and again find little evidence of profitability. Some strategies do yield win percentages in excess of 50%, but are not generally strong enough to overcome the commission of the sportsbook.

In a major journal article on NFL betting, the Efficient Markets Hypothesis was studied by Zuber et al. (1985). In their article, “Beating the Spread: Testing the Efficiency of the Gambling Market for National Football League Games,” the authors test the financial theory of market efficiency directly through a regression-based test and also test if the rate of return on any given gambling strategy is equal to the bookmaker’s commission on betting games.

Zuber et al. (1985) used data from the 1983 NFL season to test for market efficiency through an equation similar to (13.1) above that used Las Vegas point spread and a constant as independent variables meant to forecast game outcomes. As noted above, the null hypothesis of market efficiency is a joint test that the intercept of this equation is equal to zero and the coefficient on the Las Vegas Point spread is equal to one.

Each week of the 1983 NFL season was tested individually and in 13 of the 16 weeks, the null hypothesis of market efficiency could not be rejected. However, the extreme alternative hypothesis that the point spread is unrelated to the outcome of the game (intercept equal to zero and coefficient on point spread equal to zero) could also not be rejected in 15 of the 16 weeks of this NFL season. Therefore, with market efficiency squarely in doubt, the authors developed an alternative test for semistrong market efficiency based on bettor returns.

A separate regression model was formulated using the score differential as the dependent variable and a variety of NFL team and player performance data as a matrix of independent variables. The NFL statistical data included yards rushing, yards passing, wins, fumbles, interceptions, penalties, percentage of passing plays, and number of rookies. In estimating this model, the authors found all of the included independent variables to be significant with the expected signs.

They then used this model, at the half-way point of the season, to estimate the score differential for each of the games in the following week for the remainder of the NFL schedule for 1983. Using this information, they constructed a simple betting rule such that when their forecasted game outcome differed by some threshold (0.5, 1, 2, and 3 were the chosen values) from the Las Vegas point spread, a bet would be made on the appropriate team. Using the chosen filter value of 0.5, 59% of bets placed in this manner (out of a sample of 102 games which fit the requirement) were winners. Following this strategy and using a bet of \$110 to win \$100, profits of \$1,380 were generated for the second half of the 1983 season. Although their conclusions are tempered by noting that the returns are based on a single season, past returns are not indicative of future returns, and that speculative inefficiency does not necessarily imply market inefficiency, the authors do ultimately conclude that there are true market inefficiencies in the NFL gambling market which are exploitable.

Shortly after the publication of Zuber et al. (1985), a comment on this article was also published. In "Hold Your Bets: Another Look at the Efficiency of the Gambling Market for National Football League Games," Sauer et al. (1988) reexamined the findings of the previous study. Sauer et al. (1988) were able to present evidence that contradicted the results found in Zuber et al. (1985) through a variety of tests of market efficiency.

Sauer et al. (1988) started by using the 1983 NFL data sample tested in the Zuber et al. (1985) study and combining the weekly samples of games into a single 16-week dataset. Given that there is no a priori reason for a weekly study and through the fact, which the authors note, that the least-squares estimator is inversely related to sample size, the yearly sample is clearly a much better measure for study of market efficiency. In the sample of the entire 1983 season, the null of market efficiency (intercept of zero and coefficient on point spread equal to one) could not be rejected. Perhaps even more importantly, however, the extreme null hypothesis that the score differential was unrelated to the Las Vegas point spread was soundly rejected.

Furthermore, Sauer et al. (1988) proceeded to use the same statistical information about the NFL games used by Zuber et al. (1985) (Passing yards, rushing yards, etc.) to show that these game statistics had little to no explanatory power as it relates to the difference between the actual outcome of an NFL game (score differential) minus the Las Vegas point spread. The small information added by the individual game statistics would be very difficult, if not impossible to exploit, in attempting to set a profitable betting rule for NFL games. To further illustrate this point, the authors also include a regression model where the Las Vegas point spread is included as an additional independent variable, along with the game statistics, with the score differential as the dependent variable. The only significant variable was found to be the point spread, with all other information being insignificant in this model.

This clearly implies that the point spread includes all of the statistical information about the teams in a single price in this financial market, which is at the heart of what market efficiency truly implies.

Finally, Sauer et al. (1988) show that future returns using a strategy based on the model of Zuber et al. (1985) took substantial losses in the following NFL season (1984). Therefore, the claims of market inefficiency did not seem warranted within this betting market. Overall, this result served as an important stamp of approval for the efficient markets hypothesis, especially given that bettors were (and still are) thought of as often quite biased toward their home/favorite teams and emotions generally run very high in this market.

13.4 Further Support for Market Efficiency

Sports betting markets have been used in a variety of ways to test market efficiency. Following the studies of Zuber et al. (1985) and Sauer et al. (1988), other methods to study different aspects of market efficiency were performed by researchers. Russo et al. (1989) carried out cross equation tests of rational expectations using NFL betting data. Their analysis could not reject rationality in this wagering market.

Lacey (1990) studied market efficiency in the NFL betting market for the 1984–1986 period. Overall, market efficiency could not be rejected. Some of the betting rules studied by Lacey (1990) appeared to generate profits, but due to the small sample used in the study, statistical significance of these strategies could not be confirmed.

Dana and Knetter (1994) tested whether bettors in the NFL wagering market learned from past events. In general, they found that these markets are efficient. They concluded that bettors found it difficult to correctly process and incorporate the wide range of information available for NFL games. However, even with these difficulties, the null of market efficiency could not be rejected. One interesting finding in the paper which compared actual results to the predictions implied by their model was that bettors were found to weight recent information about NFL teams (game results, etc.) in a less than optimal fashion.

Boulier et al. (2006) used a sample from 1994 to 2000 to test a variety of possible betting strategies, including those based on power ratings and stadium effects. Overall, their findings support the concept of the efficient market hypothesis in the NFL betting market.

13.5 Rejections of Market Efficiency in Subsets of NFL Gambling Markets

Though not found in every subsample, certain common subsets within the NFL wagering market data appear to offer potential profitable betting strategies. One common finding is that home underdogs in the NFL generally perform quite well against the point spread. These results could be a function of systematic bettor errors in evaluation of the effects of the home field advantage. Given that the results mainly are favorable for home underdogs, rather than road underdogs, the results could also reflect bettor preferences for the best teams, as only high-quality NFL teams generally are strong enough to overcome the implicit home field advantage to be posted as road favorites.

Gray and Gray (1997) found support for a profitable strategy based on backing home underdogs. They adapted the model of market efficiency in (13.1) by replacing the actual point spread, PA, by the (0,1) dummy variable, PWIN, which is categorized as one where a bet beats the spread. Equation (13.1) was estimated by probit and predicted probabilities were extracted. Using this probit-based study of betting strategies for the NFL, Gray and Gray (1997) found that home underdogs win more than were implied by efficiency. In their dataset, a simple strategy of wagering on home underdogs earned 4% in excess of the sportsbook commission. In addition, if the road favorite had recently performed well during the NFL season, they found it was a particularly good time to bet against these teams. Osborne (2001) also found some possible rejections of the efficient markets hypothesis, including strategies involving home underdogs, in his study of the NFL.

Kochman and Goodwin (2004) also found support for wagering on underdogs in the NFL. They found an underdog bias, with inflated prices existing in the NFL betting market on favorites. Dare and Holland (2004) also found inflated prices on road favorites in their study of the NFL. In their dataset, home underdogs won more often than implied by the efficient markets hypothesis, but the authors surmised that the bias in the market may be too small to be exploited by gamblers. Vergin and Sosik (1999) also found support for wagering on the home team, particularly underdogs, in the NFL. In addition, they find that the success of wagering on home underdogs may stem from national coverage of popular teams, including the favorite teams' national television exposure.

Other strategies which offered potentially positive returns for bettors involved betting against winning streaks or against teams who have recently performed very well. Vergin (2001) studied the NFL betting market from 1969 to 1995 and found that the betting market appears to overreact to recent information. When teams do particularly well in one week, betting against that team the next week revealed positive returns. This result was also found for teams with excellent performances for their most recent 2–5 games as well. Interestingly, the results were not found to be symmetric. When teams underperformed, a strategy of wagering on the previously underperforming team in the next week appeared only to break even.

In a conceptually similar study, Woodland and Woodland (2000) found in their study of the "hot hand hypothesis," first identified in the NBA betting market, that wagering against teams on winning streaks against the point spread were found to win more often than implied by efficiency. Using various contrarian betting strategies, Woodland and Woodland (2000) identified this bias in the NFL.

One study which illustrates that speculative inefficiencies may persist within a subset of an overall efficient market is presented by Paul and Weinbach (2002). This particular NFL study focused on the totals market, a market where bettors place wagers on the total number of points scored within a game. The two propositions in the totals market are an over wager, where the bettor wagers that the combined points scored by both teams will exceed the posted total (the total set by sportsbooks) and the under wager, where bettors wager that fewer points than the posted total will be scored.

The totals market for the NFL, and other sports, may be influenced by a behavioral bias, if the betting public tends to find one side of the proposition more favorable than the other. If bettors and fans prefer high-scoring games, which we anticipate would be more exciting, relative to low-scoring games, which may be rather dull defensive struggles, one can easily anticipate a bettor bias toward the over as opposed to the under. For a sample of NFL games from 1979 to 2000, Paul and Weinbach (2002) show that the null hypothesis of market efficiency cannot be rejected for the overall sample of all games. However, when the sample is broken into the games where scoring is expected to be highest, market efficiency can be rejected. A simple betting strategy of betting the under in the subset of games with the highest totals revealed statistically significant and profitable returns.

Golec and Tamarkin (1991) also found evidence of inefficiency in over/under betting in NFL games in the 1990s. The aggregate inefficiencies were statistically significant but lacked economic significance in that they were too small to generate sustained profits through a betting strategy. Golec and Tamarkin point to indivisibilities in points scoring (3 for field goal and 7 for touchdown with point after are common units in NFL). A test of whether over/under inefficiency is attributable to points indivisibilities is available through the introduction of the two point conversion in the 1994 season, although to date such a test has not been published. Alternatively, inefficiency could be driven by a small number of unusual game outcomes, given that teams only play 16 games per season.

Paul and Weinbach (2002) provide alternative behavioral explanations for why the apparent market inefficiency may persist in the over/under market. One possible explanation is that sportsbook limits on wagers, especially for known informed bettors (sometimes referred to as "wiseguys"), prevents enough money from being wagered on the under to reveal a closing total which is an optimal and unbiased forecast of the outcome of the game. Therefore, a general preference held by the majority of bettors cannot be fully balanced by money taking the contrary position. While the restrictions of betting limits can be mitigated by visiting multiple sportsbooks, or hiring others to place bets for you (which is illegal in Las Vegas), the increases in transactions costs associated with such moves likely act as a deterrent. Given the all-or-nothing nature of the betting market, where bettors either lose their entire wager or have a windfall gain, the fact that based on the 11 for 10 rule, the bettor must win more than 52.38% of wagers to have positive returns, and the restrictions on the size of a position that an investor can take on an individual game, knowledgeable investors may find the NFL totals market to be less attractive than other investment opportunities.

Another area of research within the NFL betting markets where profitability has been found within a subset of games is in the reaction of betting markets to weather. Borghesi (2007) found that temperature affects performance of football teams, in some cases in an ex ante predictable manner. For the overall sample studied related to weather. Overall, it appears that betting markets do not fully incorporate all available information related to weather into the point spreads and totals. For instance, in cold weather, it appears that home teams, in these cold-weather cities, are underpriced. Therefore, wagering on these home team can earn positive returns for bettors. Similarly, in a study of totals markets, Borghesi (2008) found that adverse weather will affect the total points scored in a game, but that effect may not necessarily be fully incorporated into the posted total on the game. In poor weather, a strategy of betting on the under reveals profits as the weather effects on the game do not appear to be fully incorporated into the price (total) in this betting market.

13.6 Levitt, the Unbalanced Book, and Profit Maximization by Bookmakers

Levitt (2004) changed the study of the NFL gambling market by suggesting, based on his data sample, that sportsbooks do not set prices to balance the book, as was commonly assumed, but instead sets a price that maximizes profits. Levitt states that sportsbooks actively choose prices (point spreads) which systematically exploit known bettor biases, in particular for road favorites, which allows them to earn greater profits than setting a point spread which would balance the books and clear the market.

In his article in *The Economic Journal* titled “Why are Gambling Markets Organized So Differently from Financial Markets?” Levitt makes the case that sportsbooks do not play the traditional role of a market maker, but instead takes large positions with respect to the outcome of the game. This is a major departure from the original assumptions used in previous studies of market efficiency in the NFL. Earlier research assumed that bettors were the ones ultimately responsible for the closing price in this market, with sportsbooks responding to disproportionate wagering by adjusting the point spread until ultimately the point spread effectively divided the betting activity, with each individual bettor, armed with his own evaluation of all available information, acting in his own self interest and adding to the collective wisdom of the market, ultimately producing a point spread that reflects the consensus of bettors and reflects an unbiased forecast of the game outcome.

Levitt (2004) cites earlier research of demonstrated bettor biases in the NFL point spread betting market for home underdogs, specifically, a tendency for underdogs and home underdogs to outperform expected returns. Using this a priori information, the paper explores a way to explain these findings by showing that sportsbooks purposely price to exploit these behavioral biases, allowing them to earn greater profits than they would by setting a market clearing price.

The data used in this study is from a betting contest from an online sportsbook. Bettors picked five games a week against the point spread for each week of the 2001–2002 NFL season. A total of 285 bettors were tracked and the entry fee for the contest was a fixed $250. There are problems with this type of data, most notably that there are not the normal marginal incentives within this gambling market due to the fixed-cost entry fee. Individual wagers are not placed, nor does the denomination of dollars wagered change in any of these contest bets, unlike what may happen in real betting markets. In addition to the lack of marginal incentives, the question must be raised if these contest participants are truly representative of actual bettors in the NFL wagering market in Nevada or offshore. While there are other problems with this data, such as bettor attrition over the season, and the fixed-nature of the point spread from early in the week in this sample, the data was the best available for study at the time. While imperfect, the data offered insight into the behavior of bettors, with participants of a sports betting contest serving as a reasonable proxy for sportsbook bettors.

The first important finding of the Levitt (2004) study is that the sportsbooks do not balance the book. Favorites received a disproportionate share of the wagers (60.6% in sample) with road favorites attracting even a greater share (68.2% in sample). Consistent with earlier research, the propositions that attracted a greater share of the bets won less than 50% of the time as underdogs and home underdogs outperformed favorites and road favorites.

Taking these results and assuming that the distribution of the bets within his sample was representative of overall betting and that there is no information in aggregate bettor preferences, Levitt (2004) calculates that bettors should win 49.45% of their wagers. This leads the bookmaker to increase their gross profits by 23% over the situation where bettors win half of the time. Although sportsbooks do undertake risk in this situation, when compared to a perfectly balanced book, Levitt (2004) estimates that given the profit rate and standard deviation, sportsbooks would only expect to take negative gross profits 1 out of every 100 years.

Next, Levitt (2004) explores the possibility that there are skilled bettors participating in this market. Through his tests, he concludes that there is little evidence of heterogeneity in skill across bettors. In other words, using his sample, the sportsbook appears more skilled at predicting outcomes of games than individual bettors, suggesting that sportsbooks have superior information. If bookmakers are more skilled at forecasting game outcomes than bettors, they can choose to price not simply to clear the market, but to exploit persistent bettor biases, such as preferences for road favorites.

Given that the study of Levitt (2004) used a fixed-entry fee betting tournament, and not actual sportsbook data, the possibility remained that his findings were unique to this dataset and not representative of betting markets in general. Shortly after the Levitt (2004) study was published, Sportsbook.com, a large and established online sportsbook began releasing data on bettor activity in a special "Betting Trends" page on their Web site. The data includes information on the percentage of dollars wagered on favorites and underdogs and overs and unders. Paul and Weinbach (2008) used data collected daily from sportsbook.com for the 2006–2007 NFL season to test the conclusions of Levitt (2004) with market driven data.

Through simple regression models, Paul and Weinbach (2008) illustrate support for the hypothesis of Levitt (2004) with actual sportsbook data. The percentage bet on the favorite was shown to have an intercept greater than 50% and the percentage bet on the favorite increased with the point spread. In addition, a dummy variable for road favorites was also shown to have a positive and significant effect on the percentage bet on the favorite. In short, the best teams noted as big favorites and road favorites (teams who are strong enough to overcome the implicit home field advantage and are still favored as the visiting team) attracted a majority of the money bet on the game. In addition, in the totals (over / Under) market, the percentage bet on "over" was also shown to increase with the posted total. Games with a high level of expected scoring (highest totals) were shown to attract a very high percentage of dollars wagered in the totals market.

These results support the Levitt (2004) hypothesis as they reject the commonly assumed balanced book model of sportsbook behavior. Moreover, Humphreys (2010, 2011) reports evidence counter to the balanced book hypothesis from betting on National Basketball Association and NFL, respectively. This suggests that rejection of balanced books may be more pervasive and general than was first thought.

In an effort to determine if sportsbooks could earn greater returns by attracting imbalanced betting, Paul and Weinbach (2008) performed simple betting simulations. (For example, when a strong bettor bias for a road favorite is projected for a specific game, a sportsbook may choose to modestly "inflate" a point spread above what it considers to be an optimal forecast, where the "inflation" provides the sportsbooks with a slight edge, but is not enough to discourage bettors from betting on the road favorite, allowing the bets to remain more heavily toward the road favorite). In this way, the sportsbook can earn enhanced profits when game outcomes contrary to public opinion occur. Using the data from the 2006 to 2007 NFL season, simple betting thresholds based on percentage bet on the favorite (or over) were established and a betting rule of wagering on the less popular side of the proposition were explored. For games where 70% or more was wagered on the favorite, underdogs were shown to win 64% of the time (earning profits of $2,530 for the season based on wagering $110 to win $100). Similar results were shown for other thresholds, including a win percentage of over 57% for all games where 55% or more was bet on the favorite. The totals market also revealed positive returns in this sample, but only for the games which were the most heavily imbalanced. These results illustrate that the sportsbook (and contrarian bettors) can earn significant profits through the common biases of the betting public overbetting favorites and overs.

Paul and Weinbach (2008) present these results as support of Levitt (2004) in that sportsbooks are not balanced and their pricing strategy tends to earn greater profits for the sportsbook. In addition to the reasons provided for this sportsbook strategy by Levitt (2004), Paul and Weinbach (2008) also suggest this pricing strategy may persist because the variance in game outcomes may cause liquidity issues for potential contrarian bettors, who would need large enough bankrolls to endure potential losing streaks, and due to the fact that sports wagering market is not truly an open market. Sportsbooks have market power in the sports wagering market as they have the ability to set wagering limits, can refuse bets from known "wiseguys" or syndicates, and are known to "book to face," where they may set different limits (or prices) for known informed bettors compared to the general betting public.

Paul and Weinbach (2010) expand the tests of the unbalanced book and the implications of the Levitt (2004) hypothesis of sportsbook behavior. Data on betting percentages were expanded for Sportsbook.com and a new source of information on betting percentages was used in the form of data from Sports Insights (http://www.sportsinsights.com). The Sports Insights data differed from the Sportsbook.com data, in that more seasons were available, and the data reflected the percentage of bets placed on each side of the game (in terms of favorites/underdogs and overs/unders) instead of the percentages of dollars bet (as in Sportsbook.com).

Again using simple regression analysis, the results of the previous study in the *Journal of Prediction Markets* were confirmed for the larger sample from Sportsbook.com and the new data from Sports Insights. Both datasets showed that the percentage bet on the favorite increased with the point spread and a road favorite dummy was found to have a positive and significant effect. In the totals market, the percentage bet on the over was shown to increase as the total increased in both samples. For all datasets studied, the balanced book hypothesis was soundly rejected.

Betting simulations were also performed with similar results in the sides market. For the Sportsbook.com data, taking the contrarian position (betting the underdog) was shown to win 58.5% of the time for games with betting percentages on the favorite of 70% or more. For the Sports Insights data, a win percentage of 59% was found for games where the betting percentage on the favorite was 75% or more. In both samples, statistically significant returns were earned for underdog bettors, and therefore, sportsbook profits were greater as they were active participants in the wager as the book was generally not balanced.

Returns to wagering the under in the totals market in games where certain thresholds of the percentage bet on the over were met did not reveal significant results. Win percentages were found to be split between overs and unders, even though the money on the over dominated the money on the under. Interestingly, studies of betting percentages in other sports including the NBA, NCAA Football, NCAA Basketball, Major League Baseball, and the National Hockey League generally revealed that the balanced book hypothesis was soundly rejected, but taking contrarian strategies to public opinion won nearly half the time. This implies that the sportsbook may very well set point spreads, odds, and totals as forecasts of game outcomes and allow for significant betting imbalances. The NFL may be a unique case, where profitable contrarian betting strategies do exist and the sportsbook earns significantly greater profits by shading the point spread in the direction of favorites. This may be due to the vast size of the NFL betting market, where transactions costs involved in actively managing and monitoring the point spreads for a small number of games per week may generate great enough profits to offset the additional costs of limiting the ability of informed bettors to exploit biased prices within the market.

Other, more detailed betting information from sportsbooks can also be used to illustrate preferences among NFL bettors. For instance, Paul and Weinbach (2010) use data gathered from the premium service offered by Sports Insights, demonstrate that bettors have clear preferences for games in which they choose to wager. The common view of the profit-maximizing bettor as an investor who searches out games with likely profit opportunities appears suspect given the results of Levitt (2004) and Paul and Weinbach (2007, 2010). When the betting volume data is included in the analysis, this view of the majority of bettors as investors can easily be challenged.

Much like fans, bettors appear to wager on games with the best teams, games expected to be high-scoring, and games that will be shown on television. In other words, betting appears to be an activity more consistent with consumption than investment.

Using a regression model with betting volume per game as the dependent variable, various explanatory variables are tested for their impact on betting volume. The sum of the win percentages of the teams playing and the point spread were shown to have a positive and significant effect (implying a preference for good teams), the square of the point spread was shown to have a negative and significant effect (implying a tastes for some degree of uncertainty of outcome, all else equal), and the total was shown to have a positive and significant effect (implying a bettor preference for scoring). In addition, games on prime time television were shown to have a positive and significant effect on volume, with the exception of games shown on the NFL Network, which is only available to satellite subscribers and a limited number of cable outlets. These results are not consistent with the idea that bettors in NFL markets search out what they believe to be incorrect point spreads, attempting to exploit them, but rather as consumers of gambling, with betting on NFL games being complementary to watching the game, adding to the overall enjoyment of the NFL-viewing experience.

13.7 Sentiment and Herding

The finding that many NFL bettors are also consumers of the sport may have behavioral implications for the operation of betting markets and this question is at the frontier of current research. We organize our discussion of this new research around two main concepts: sentiment and herding.

The possibility of sentiment-based betting in the NFL was raised by Avery and Chevalier (1999). They found evidence of poorer returns than on average for bets in favor of what they defined as "glamorous" teams in the NFL, proxied by recent championship success. In recent times, the New England Patriots and Indianapolis Colts would be categorized in this way. Where sentimental bettors place large volumes of bets on these glamorous teams, point spreads move in favor of less high profile teams. Within this response, Avery and Chevalier argued that sportsbooks might set up a balanced book for regulatory reasons given, as they acknowledge, that such a strategy would not be expected profit maximizing. By contrast, Strumpf (2003) had access to police records of illegal bookmakers in New York. He found strong evidence that these bookmakers offer particularly unfavorable spreads for local teams. As Forrest (2008) observes, this form of behavior is consistent with both price discrimination by monopolistic bookmakers and unbalanced books as proposed by Levitt (2004) and Humphreys (2010, 2011).

Recall that the previous discussion points to a particular form of bias: the point spreads are biased against underdogs so a potentially profitable betting strategy is to back underdogs. A recent working paper by Wever and Aadland (2011) takes a further step to advocate a slightly more sophisticated strategy. This is to back home teams that are large underdogs – so home advantage has been underestimated – or back road teams that are even larger underdogs. According to Wever and Aadland, herd behavior leads to a bias toward favorites, which could translate into reverse favorite-longshot bias, as found by Woodland and Woodland for Major League Baseball (1994) and the National Hockey League (2001).

Wever and Aadland propose a weak form test of the Efficient Markets Hypothesis. Defining a win against spread as PW, PW = *f*(HF, HU, HF*CL, HU*CL) where HF is a dummy variable for home favorite, *HU* is a dummy variable for home underdog, *HF*CL* is an interaction term between home favorite and closing line spread, and *HU*CL* is an interaction term between home underdog and closing line spread . This equation is estimated by probit. Under the efficient market hypothesis, the coefficients on constant and all explanatory variables should be jointly zero. If the coefficient on HF*CL is positive then weak-form efficiency is rejected. The authors do indeed find a significant and positive coefficient on HU*CL. A strong form test uses out-of-sample predictions to estimate the probability that a given team covers the spread and compares the proportion of bets won with the benchmark of 0.5.

According to Wever and Aadland, a differential strategy of betting on large underdogs gives significant and profitable returns. So large underdogs are underpriced and bettors fail to recognize parity in NFL. This is also (perhaps) consistent with herd behavior toward highly publicized elite teams such as Indianapolis Colts in 2006. Perhaps forecasters (spread-setters) overreact to new information? A broader question is whether the observed betting market inefficiency is due to sentiment, as proposed by Avery and Chevalier (1999) or herding. In their analysis of sentiment betting in European soccer, Forrest and Simmons (2008) identified large soccer teams, specifically Real Madrid and Barcelona, in Spain as the source of sentiment bias in soccer betting markets. But large teams with persistently greater fan support are more difficult to identify in the NFL, in which between-season performances of teams can vary considerably due to the shortness of the season, just 16 games, and the various regulatory measures, such as the hard salary cap, imposed precisely so as to achieve parity in the League. Hence, herding behavior, with spreads that overly favor recently successful teams, is more readily identified than sentiment behavior, although this is an empirical question that merits further research.

Another working paper, by Simmons et al. (2011) explores behavioral patterns in the NFL betting market at a more disaggregated level than the market efficiency studies, by using an experimental economics approach. These authors examined a customized sample of NFL fans who collectively placed bets of more than $20,000 on NFL games. These were undergraduate student volunteers whose bets were financed out of a research grant. The authors found this group was systematically biased and "unwise" in their betting behavior. The sample had faulty intuition, where bettors predicted favorites more than underdogs against point spreads that disadvantaged favorites. This bias persisted through the season.

The paper starts with the presumption that point spreads do not equate bets on both teams (cf. Simmons and Nelson 2006; Levitt, 2004). This runs directly counter to the "balanced book" hypothesis and reasonably so. The authors find that experiment participants predicted more favorites than underdogs because they unwisely believed favorites were more likely than underdogs to beat the spread. Participants wagered more money per predicted favorites than per predicted underdog. The tendency for participants to unwisely predict favorites increased over the course of the season. Participants did not improve as they got more knowledge and experience.

The more confidently people believe that the favorite will win, the more likely they are to predict favorites to win vs. the spread, which the authors term as *intuitive confidence*. People got *more* certain that favorites will win games as the season progresses and so increase their betting on favorites. Bettors attributed successful intuition (favorite predictions) to skill and losing predictions (favorites) to luck. Winning underdog predictions were attributed to luck.

When a group of respondents were asked to predict point spreads (independent of actually betting) they tended to be accurate, i.e., inaccuracy only arose when respondents actually placed bets – so it is betting market behavior (rather than ignorance) that is driving results. The sample fitted the characterization of wise crowd through being both knowledgeable and motivated to be accurate.

Overall, this kind of experimental approach has value in discerning forms of betting behavior. However, we should caution that extrapolating the results beyond a set of undergraduates is not straightforward and application of betting experiments to nonstudent samples may not earn favor with grant-awarding bodies.

13.8 Conclusion

As this chapter notes, the study of the NFL betting markets has numerous advantages in its ease of study of economic and financial concepts. The study of the market itself is quite interesting, as gambling on NFL football legally in various locations around the world and in the state of Nevada and illegally in cities and towns across the other 49 states in the USA has grown into the large business we see today. Studying the actions of the market participants, both the gamblers and the bookmakers, provide insight into economic behavior by individuals and firms, allowing researchers to better understand fundamental concepts. On the household side, the study of NFL gambling allows for an investigation into consumer and investor behavior and helps us to distinguish between the two activities. On the firm side, the actions of the sportsbook help us understand pricing in the presence of large risks.

Specifically, the study of NFL gambling markets began with the investigation of the assumption of the balanced book hypothesis. The balanced book hypothesis assumed that sportsbooks set prices (point spreads, odds, totals) to attract even the betting action on each side of the proposition. This assumption allowed for the direct study of the intensely scrutinized Efficient Markets Hypothesis of Finance. In general, market efficiency could not be rejected in NFL gambling markets, offering support for market efficiency in a setting where bettors are likely to be fans, with strong preferences for certain teams. Findings in support of market efficiency, however, were not universal and a variety of studies revealed persistent betting patterns which allowed for contrarian strategies which rejected market efficiency and, in some cases, earned statistically significant profits. These strategies centered on wagering on home underdogs, big underdogs, and unders in the totals market.

The availability of new data directly from betting tournaments and online sportsbooks eventually allowed for the testing of the balanced book hypothesis. In the years studied for the NFL, the balanced book hypothesis was soundly rejected, leaving the actual source of the findings of market efficiency in doubt. Levitt (2004) proposed that sportsbooks shade the point spread to the more popular side of the proposition, specifically road favorites, and set prices to maximize profits. Paul and Weinbach (2008) confirmed the findings of Levitt of an unbalanced sportsbook, but suggested that the bookmaker may be pricing as a forecast, rather than purely taking advantage of the public bias for favorites and overs, to earn their commission over time and discouraged informed bettor entry into the market.

In addition to the study of market efficiency and delving into the true actions of the sportsbook as a profit-maximizing firm, this chapter also illustrated the use of NFL gambling market data to study aspects of behavioral finance. Researchers continue to take advantage of the increasingly detailed data to learn more about the actions of bettors through the study of market related theories such as investor sentiment and herding which can be tested in NFL wagering markets.

Overall, although the study of basic market efficiency using NFL betting market data has existed for nearly 50 years, we are likely only beginning to scratch the surface of the academic studies which are possible using NFL gambling data. Current and future research are likely to deepen our understanding of the behavior of sportsbooks and gamblers, further refine the concept and theories of efficient markets and behavioral finance, and use the detailed data becoming available to conduct studies which would not have been thought possible a mere decade or two ago.

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Chapter 14
An Evaluation of the Economic Impact of National Football League Mega-Events

Robert A. Baade and Victor A. Matheson

14.1 Introduction

Cities, regions, states, and countries compete vigorously with one another for the right to host mega-events. Political conventions, religious conferences, and sports events such as the Summer and Winter Olympic Games, the World Cup, Commonwealth Games, and the Pan American Games qualify as mega-events. Competition for these events has intensified given the common perception that they have the capacity to transform the economic landscape in the cities and countries that host them.

Heated competition exists within the United States to host mega-sports events for the same reason identified for events with global appeal. Professional sports leagues in the United States have parlayed the promise of hosting their hallmark events into financial gain, and arguably the National Football League (NFL) has done that more efficaciously than any other of the four major sports leagues operating in North America. The NFL's success is attributable to its position as the most popular of the team sports in the United States. Given its stature the NFL's championship and all-star games are particularly appealing to cities who bid for them. The prospect of substantial economic benefit from NFL hallmark events has given voice to a cadre of civic cheerleaders who extol the virtues of serving as hosts. Hosting, however, comes at a price, and the booster claims have evolved into justifications for the use of public funds or other civic subventions to host the NFL's showpieces. The purpose of this chapter is to evaluate the economic impact of hosting the NFL's Super Bowl, the all-star game, and the draft of new players.

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The focus in this chapter is primarily on the Super Bowl, the NFL's quintessential mega-event. The rationale for emphasizing the Super Bowl is that given its stature, the other NFL significant proceedings will induce an economic impact less than the Super Bowl. If the Super Bowl does not generate a meaningful increase in economic activity for the host community, it is less likely that events that are smaller in scope will stimulate the host city's economy.

This chapter is organized as follows. Sect. 14.2 provides a context for the Super Bowl and NFL all-star games within the panoply of mega-sports events. The next section, 14.3, discusses the uniqueness of the NFL as it relates to the costs involved in hosting an NFL hallmark event. The benefits that accrue to the host cities of their hallmark event are analyzed in Sect. 14.4. The methodology prevalent in before-the-event or ex ante studies used by the boosters to justify public subsidies for mega-events is discussed in Sect. 14.5. Section 14.6 critiques the methodological approach used by apologists for public subsidies. An alternative methodology for assessing the impact of NFL hallmark events is identified and discussed in Sect. 14.7, and the estimated economic impacts of NFL mega-events are detailed and discussed in the Sect. 14.8. Conclusions and policy implications are presented in the final section, 14.9.

14.2 How Big Is the Super Bowl?

It is important to provide a context for the NFL's showcase events which include the Super Bowl, the Pro Bowl, and player draft. Cities, after all, could bid for a number of mega-sports events. It is useful to have a sense of where the NFL's events fit into all those put out for bid. The bigger the proceeding, the more likely it will stimulate the host city's economy. This section of the paper focuses on the size of the Super Bowl to provide a basis for understanding the potential impact of the NFL's mega-events.

No definition exists for hallmark sports events, but certain characteristics are common to them. As the term suggests, a mega-event is defined by scale, which if sufficiently large increases the likelihood that it induces a measurable economic impact through increasing tourism and media coverage. Conventional wisdom would identify the World Cup as a mega-sports event, and a context for the potential economic impact of the Super Bowl could be provided by comparing the audience and the revenues for the American football championship to that of the soccer world championship. The information recorded in Table 14.1 provides some measures, admittedly imperfect, for comparing the two events.

The statistics recorded in Table 14.1 indicate that by the measures represented, the Super Bowl and the World Cup qualify as mega-sports events on a global scale, even though the Super Bowl viewing audience is primarily U.S. based.

The potential importance of the Super Bowl can be brought into somewhat sharper focus by comparing it to two other distinctly American mega-events: the NCAA Final Four and the World Series. Comparative statistics for the three mega-events are recorded in Table 14.2.

Table 14.1 Select statistics comparing the super bowl to the world cup

Statistic/event	Super bowl	World cup
Viewership	106.5 million[a] (2010)	715.1 million (2006 final) and an estimated 26.29 billion for all 64 games (2006)
Number of Games	1	64
Total Time Played	60 min	96 h
Ad Revenue	$213 million (2009)	$1 billion (estimated for 2006)
Ticket Price	$800–1,000 (2010)	$400-900 (2010 final)
Ad Revenue per minute of playing time	$355,000	$176,000

Source: http://matadornetwork.com/sports/the-world-cup-is-246x-bigger-than-the-super-bowl
[a]This represents the largest audience ever to view a television program in the United States displacing the final episode of *MASH*

Table 14.2 Statistics comparing the super bowl to the NCAA final four and the world series

Year/event and ad revenue ($millions)	Super Bowl	World series (number of games)	NCAA men's basketball final four (number of games)
2002	134.2	141.2 (7)	101.3 (3)
2003	130.1	124.3 (6)	117.6 (3)
2004	149.6	113.4 (4)	126.4 (3)
2005	158.4	146.9 (4)	142.2 (3)
2006	162.5	160.5 (5)	154.7 (3)
2007	151.5	156.6 (4)	168.4 (3)

Source: http://www.datasofa.com/app#/data_sets/1142

The information clearly indicates that per game the Super Bowl generates more ad revenue than either of the other mega-sports events that are uniquely American. Having established the mega-event status of the Super Bowl, the costs incurred in hosting the event are identified and distinguished from the costs involved in hosting other mega-events.

14.3 Costs Incurred in Hosting an NFL Mega-Event

Suitor cities understand that competing to host a mega-sports event will require significant costs that almost without exception will necessitate public funding.[1] A substantial portion of those costs involve the construction of infrastructure

[1] An exception to this occurred with the 1984 Los Angeles Summer Olympic Games. The exception is attributable to the fact that the City of Los Angeles was the only city bidding for the Games in 1984. The International Olympic Committee (IOC) was in no position, therefore, to compel the construction of infrastructure as is typical with multiple suitor cities.

that will provide playing venues as well as transportation, communication, and accommodation for officials and spectators attending the event. Studies of sports mega-events do indicate that sustainable economic impact from a hallmark event is likely the result of infrastructure embellishment relating to event accommodation in the transportation, communication, and hospitality sectors of the economy rather than venue construction. Given the fact that the Super Bowl is a one-day event, a rationale for public subsidies differ in at least two ways from that of the Olympics and the World Cup events, which require infrastructure to meet the needs of fans for a fortnight at least. First, the NFL can argue with little conviction that the duration of the event requires the development of ancillary infrastructure indirectly needed to accommodate the event, which will serve as a stimulus for sustainable economic activity. Second, the lack of a rationale for ancillary infrastructure development focuses attention on the stadium alone as the catalyst for an increase in economic activity attributable to the event. The NFL, therefore, cannot encourage the development of ancillary infrastructure for the event in the same way that the IOC or the Federation Internationale de Football Association (FIFA) can. The NFL has had to devise a strategy to encourage potential host cities to bid for the Super Bowl.[2]

The NFL has linked the designation of a host city for the Super Bowl to the willingness of a team to construct a new stadium, and, at least tacitly given the enormous cost involved, to the willingness of the host city to support that construction with taxpayer dollars. The NFL has helped even the most parsimonious cities justify those public subsidies through sponsoring studies that indicate that the Super Bowl induces an increase in economic activity in the host city that numbers in hundreds of millions of dollars. The situation in Atlanta presently provides a good example of the NFL's strategy.

The NFL Atlanta Falcons currently play in the Georgia Dome, a 71,000-seat stadium that is 18 years old. The bonds on the Georgia Dome will not be paid until 2018 or 2019, but Roger Goodell, the Commissioner of the NFL, has indicated that the construction of a new open-air stadium would bring the Super Bowl back to Atlanta. Goodell observed:

> The bar has been raised because you're getting facilities around the country in great communities. These games (Super Bowl) are a tremendous value to the communities and there's a lot of competition for it. So I think a new stadium with this great community (Atlanta) would be beneficial to bringing another Super Bowl to this community.[3]

Commissioner Goodell's posture echoes that of his predecessor, Paul Tagliabue, who devised the "stadium for Super Bowl" gambit. The 2008 Super Bowl, for example, was played in the University of Phoenix stadium in Glendale Arizona 2 years after the stadium opened on August 1, 2006. The Arizona Sports and Tourism

[2] It should be noted that, all else equal, the more participants there are in an auction, the more likely that the winning bid will exceed the benefit from the auctioned item. The benefit from hosting the Super Bowl is the economic impact that it ostensibly yields.

[3] NFL.com news, "Goodell: New stadium would bring Super Bowl back to Atlanta," http://www.nfl.com/news/story/09000d5d81c0b6bc/article/goodell-new-stadium-would-bring-super-bowl-back-to-atlanta.

Authority contributed $300.4 million to the project after a long bitter battle for public funding.

The Super Bowl inducement to NFL cities to build or renovate stadiums now includes cold-weather cities, and that expands the pool of metropolises bidding for the Super Bowl. The fact that the 2014 Super Bowl will be held in the new $1.6 billion Giants-Jets Stadium in the Meadowlands will likely lead to very active bidding for the Super Bowl beginning in 2018 as the Super Bowls in 2015, 2016, and 2017 are scheduled to be played in warm weather or indoor stadiums. Commissioner Goodell has indicated that depending on the New York experience in 2014, future Super Bowls could be played in cold-weather cities. A larger pool of potential cities, all else equal, will likely lead to increased financial pressure on cities for public funding of stadiums, the price cities pay for hosting the Super Bowl event.

The cost of hosting a Super Bowl exceeds the direct cost of a new stadium for the host city since indirect costs are also incurred. Referring back to Atlanta, if Atlanta had two stadiums that could host football, then the competition between them would reduce rents for other events that the stadiums could accommodate. The additional debt service imposed by another stadium could have implications for the bond rating for Atlanta in particular and for other cities pursuing the aggressive stadium strategy articulated by Commissioner Goodell.

On a national stage, new stadiums with new revenue generating amenities exacerbate the pressure teams can exert on cities to build new, state-of-the-art facilities. Some teams have contracts with provisions for lease escape should their stadium not measure up to the current standard. Consider the contract for the St. Louis Rams as noted by Peter Callaghan. In referring to the example set by the $1.2 billion new Dallas Cowboys stadium, Callaghan observed:

Every time an announcer referred to the new stadium as “state of the art” (as though any new building isn’t), Rams fans might have been wondering how long their team would be around.

That’s because the Rams, playing in the not-so-long-ago-state-of-the-art Edward Jones Dome are threatening to move even though the stadium is just 14 years old. Under the lease, if the stadium isn’t among the eight most-state-of-the-art in the National Football League, the team can demand that it be improved. By next season, 23 stadiums will have been built or renovated since St. Louis built the dome.[4]

The direct costs to the host city entail more than the stadium. Services and security costs are significant and controversial especially now as municipalities struggle to balance budgets. The City of Arlington, where the new Cowboys stadium is located, has allocated $2 million for Super Bowl expenses to accommodate the 2011 event. Communities nearby will also incur costs in conjunction with Super Bowl XLV. Dallas and Fort Worth have committed $3 and $4.5 million to cover expenses anticipated in conjunction with the February 6, 2011 Super Bowl event in Arlington, Texas.[5]

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[4] Peter Callaghan, “New stadium could spark Round Two of tax subsidy begging,” *The News Tribune,* September 29, 2009, http://www.thenewstribune.com/2009/09/29/897268/new-stadium-could-spark-round.html.

[5] Jason Whitley, “Cities spending millions to stage Super Bowl,” *WFAA.com*, http://www.wfaa.com/news/local/Cities-spending-millionsto-stage-Super-Bowl-XLV-10.

The NFL Pro Bowl, the other NFL mega-event involving on-field competition, costs a significant amount of money for the host city, and that cost is likely to rise in the future given that the NFL awarded the 2010 event to Florida rather than Hawaii. The Pro Bowl had been played in Hawaii for 30 years prior to 2010, and it will return to Hawaii in 2011. The NFL has made no commitment beyond 2011, and that lack of commitment likely implies that the event is out for bid. The NFL Pro Bowl is the largest and most expensive event hosted by the Hawaii Tourism Authority (HTA). The HTA paid the NFL \$5.3 million for the rights to host the event in 2004, and that sum paid to the NFL constituted more than 66% of the HTA budget devoted to sponsoring events (Baumann et al. 2009).

The substantial costs incurred by cities who do host the Super Bowl and the Pro Bowl are justified by the NFL through league-commissioned studies measuring the impact of the events on the host city's economy. The next section of this chapter identifies and discusses the magnitude of the economic impact host cities can expect according to the league-sponsored studies.

14.4 The NFL Rationale for Hosting the League's Hallmark Events: The League's Measure of Economic Impact

Joint studies conducted by the National Football League (NFL) and various economic consulting firms have estimated an economic impact from the stadiums-for-Super-Bowl XXXIII of between \$300 and 500 million on local economies. If those numbers are accurate, "Super" is indeed an apt description of the event. Only a handful of other sporting events such as the Summer and Winter Olympic Games or soccer's World Cup and Champions League final can seriously be thought to generate an impact of such magnitude. Booster studies in general have estimated an

Table 14.3 Economic impact estimates provided by boosters for selected super bowls between 1995 and 2003

Year	Author	City	Estimate in millions of \$ and (in millions of \$ 2,000)
1995	NFL and Kathleen Davis, Sports Management Research Institute	Miami	365 (412.4)
1998	PriceWaterhouseCoopers	San Diego	295 (311.7)
1999	NFL and Kathleen Davis, Sports Management Research Institute	Miami	393 (406.2)
2000	Jason Ader, Bear Stearns	Atlanta	410 (410)
2000	Jeffrey Humphreys	Atlanta	292 (292)
2003	Super Bowl Host Committee	San Diego	375 (356.8)
2007	PriceWaterhouseCoopers	Miami	390 (406.5)
2008	W.P. Carey MBA Sports Business Program	Phoenix	500.6 (500.9)

Source: (Baade and Matheson 2006)

economic impact of $300–500 million in current dollars from the Super Bowl as the information in Table 14.3 below indicates.

Tacitly, the NFL-commissioned studies envision hordes of affluent, nonresident spendthrifts descending on the host city for its mega-events. The NFL-SMRI team reported that the average income of Super Bowl attendees is more than twice that of the average visitor to South Florida during the peak tourist months of January and February ($144,500 compared to $40,000–80,000), and they spend up to four times as much as the average visitor to South Florida ($400.33/day compared to $99–199 per day). Jim Steeg, who served as the NFL's Vice President for special events for 26 years beginning in 1977, puts the Super Bowl at the center of the mega-event universe.

> The Super Bowl is the most unique of all special events. Extensive studies by host cities, independent organizations and the NFL all try to predict the economic impact the big game will have on a community. They talk to tens of thousands of attendees, local businessmen, corporate planners, media, and local fans—looking to see how they are affected. These studies have provided irrefutable evidence that a Super Bowl is the most dramatic event in the U.S. Super Bowl patrons are significantly more affluent, spend more and have more spent on them, and influence future business in the community more than attendees of any other event or convention held in the U.S. (Steeg 1999).

Steeg based his Super Bowl claims on several factors. Most prominent among them from his perspective were: the substantial spending by the NFL and NFL Properties[6]; the number of visitors from outside the community who attended the game and related events; and the ideal fit of the Super Bowl into the convention calendar. The Super Bowl, Steeg opined, has the capacity for transforming the historically slack month of January into a convention windfall for the host city.

It is noteworthy that the economic impact generated by the Super Bowl often approximates public subsidies for stadium construction in the NFL. According to the NFL it is conceivable that the public subsidy for a new stadium can be recouped through hosting the Super Bowl. The NFL has used this argument to convince host NFL cities that an investment in a stadium is a sound business decision.

Hosting the Pro Bowl follows a similar cost-benefit-analysis logic. Baumann et al. (2009) noted:

> …the HTA estimated that the 2007 Pro Bowl attracted 27,625 visitors to Hawaii resulting in US$28.03 million in visitor spending US$2.72 million in tax collection. Second, the HTA suggests that sporting events serve to publicize Hawaii to prospective tourists…Third, these events may improve the quality of life of the Island's residents by allowing them opportunities to watch or participate in the major sporting events.[7]

If the economic impact studies are correct, then hosting these events are justified on economic grounds. The next section of the paper evaluates the methodology

[6] Steeg claimed that the NFL and NFL Properties spend a combined $43 million on Super Bowl XXXIV, for example.

[7] Baumann et al. (2009).

used by boosters for hosting the NFL mega-events, and discusses the implications for the economic impact studies used to rationalize the use of public money to host these events.

14.5 Evaluating the Methodology of League Ex Ante Economic Impact Studies

The NFL has been successful in encouraging cities to financially support the construction of new infrastructure for its teams. The NFL represents the teams to include promoting their financial interests. The League's strategic success in convincing host cities to build team infrastructure requires further scrutiny. It may be that the League's interests do not mesh with those of society, and League authored estimates may not accurately represent the true impact of the Super Bowl for host cities. A motivation for embellishing the impact does exist.

Many scholars not directly connected to the NFL disagree with League inspired estimates on the economic impact of the Super Bowl. The significant differences among the economic impact estimates for the Super Bowl call into question estimation techniques of those who stand to gain from hosting the event. Defined in 2000 dollars, the $120 million difference between the high (Miami, Florida) and low estimate (Atlanta, Georgia) of the economic impact from the Super Bowl as identified in Table 14.3 is not trivial. Jeffrey Humphreys, the author of the low number, also assessed the impact of Super Bowl XXVIII on the city of Atlanta and the state of Georgia. Humphreys estimated that the event created 2,736 jobs and had an impact of $166 million on the Georgia economy (Humphreys 1994). Of the $166 million, Humphreys estimated a direct and indirect economic impact of $76 and $90 million, respectively. The direct impact was derived from estimating the number of "visitor days" (306,680) and multiplying that statistic by the average estimated per diem expenditures per visitor ($252). The indirect or induced economic impact was estimated using the Regional Input–output System (RIMS II) model developed by the Bureau of Economic Analysis. Humphreys estimate for 1994 for the Super Bowl's economic impact on Atlanta was in current dollars $126 million less than the estimated impact for the Super Bowl on the same city 6 years later. A portion of the $126 million dollar difference can be explained by price changes over the 6-year period, but the differences suggest other possible explanations, some of which are apparent in accounting for the roughly $227 million difference in current dollars between the estimates of economic impact for Super Bowls XXXIII and XXVIII. Most of the difference between those two real estimates is attributable to the number of visitors and the daily spending attributable to each of them.

The differences in economic impact from the Super Bowl go beyond visitor numbers and daily spending. Phil Porter provided a far less sanguine appraisal of the Super Bowl's economic impact (Porter 1999). Porter used regression analysis to determine that the impact of the event was statistically insignificant, that is not measurably different from zero. After reviewing short-term data on sales receipts for several Super Bowls, Porter concluded:

> Investigator bias, data measurement error, changing production relationships, diminishing returns to both scale and variable inputs, and capacity constraints anywhere along the chain of sales relations lead to lower multipliers. Crowding out and price increases by input suppliers in response to higher levels of demand and the tendency of suppliers to lower prices to stimulate sales when demand is weak lead to overestimates of net new sales due to the event. These characteristics alone would suggest that the estimated impact of the mega-sporting event will be lower than the impact analysis predicts.[8]

Similarly an examination of twenty-five Super Bowls from 1973 to 1997 by Baade and Matheson found the game correlated with an increase in metropolitan area employment of 537 jobs for the host. Based on simple assumptions regarding the value of a job to a community, they estimate an average economic impact of roughly $30 million less than one-tenth the figures touted by the NFL (Baade and Matheson 2000, 2006). Another study by Coates and Humphreys an examination of all post-season play in American professional sports found that hosting the Super Bowl had no statistically significant effect on per capita income in the host city (Coates and Humphreys 2002).

From 1995 through 2003, roughly the same period for the sample of economic impact estimates in Table 1.3 approximately $6.4 billion, an average of $304 million, was spent to build or substantially refurbish twenty-one NFL stadiums. The public contribution was $4.4 billion, an average of $209 million, or roughly 69% of the construction costs of these facilities (Peter 2002). Another $4.7 billion was spent on another six NFL stadiums between 2006 and 2011 over $2 billion of which was public money. The NFL has offered the Super Bowl as an inducement to convince otherwise reluctant cities that the construction of a new stadium makes economic sense. Scholars do not agree on the economic impact of the Super Bowl, and in the next section of this chapter, reasons for the disagreement are identified and analyzed.

14.6 Theoretically Accounting for the Differences in Economic Impact Estimates

If there is an exaggeration of the benefits induced by a sports mega-event, it occurs for several fundamental reasons. First, the increase in direct spending attributable to the games may be a "gross" as opposed to a "net" measure. Some subsidy advocates estimate direct spending by simply summing all receipts associated with the event. The fact that the gross-spending approach fails to account for decreased spending directly attributable to the event represents a major theoretical and practical shortcoming. Surveys on expenditures by those attending the event, complete with a question on place of residence, would appear to be a straightforward way of estimating direct expenditures in a manner that is statistically acceptable. Such surveys may

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[8] Porter (1999).

well provide acceptable spending estimates for those patronizing the event, but they do not reveal changes in spending by residents not attending it. It is conceivable that some local residents or potential visitors may dramatically change their spending given their desire to avoid the congestion at least in the venue's environs. A basic shortcoming of typical economic impact studies, in general, pertains not to information on spending by those included in a direct expenditure survey, but rather to the lack of information on the spending behavior for those who are not.

Baade (1996) cited the failure to account for the difference between gross and net spending as a chief reason why sports events or teams do not contribute as much to metropolitan economies as boosters claim. However, in the case of the Super Bowl a large proportion of all attendees come from outside the local area, and their spending qualifies as net new spending. If the host city's residents who do not attend do not reduce their expenditures within the city, one might contend that direct expenditure by nonresidents who attend events approximates net impact. Unfortunately, this will not be true if some nonresidents, who might have visited the city, decide not to do so because of congestion and high prices during the Super Bowl or the Pro Bowl. In addition, some Super Bowl fans may have already been planning on visiting a city but rearrange their schedule to accommodate the game. Even though the economic analyst may attribute this visit to the Super Bowl, in fact, this type of time switching does not lead to a net increase in economic activity in the city but simply alters the time period during which the activity takes place.

Recent evidence assessing the economic impact of other mega-events indicates the importance of substitution effects. The evidence from the Summer Olympics in 2000 in Sydney, Australia, for example, indicates that certain kinds of substitution effects may be substantial even in cases where the event has a clear international character. An Arthur Andersen Hospitality and Leisure Services (2000) survey on hotel activity in Sydney and other capital cities prior to and during the Olympic Games concludes:

> As expected, survey results indicate the vast majority of Sydney hotels peaking at near 100% occupancies during the Games period from September 16–30. This represents an increase of 49% in occupancy levels relative to the first half of September. In contrast, other capital cities experienced significant demand shortfalls for the same period. For example, occupancies in Melbourne and Brisbane plummeted by 19 and 17% in the second half of September relative to the period from 1–15 September. Overall, with the exception of Sydney and Adelaide, all hotel markets in Australia experienced a decline in occupancy in September 2000 relative to September 1999 despite the Olympic Games, as reported in the Hotel Industry Benchmark Survey. Hoteliers indicate that while international demand was strong…, domestic leisure travel traditionally taking place during the September school holiday period was displaced to Sydney for the Olympics.

The Anderson report indicates the importance of substitution effects, and compels consideration of which, if any, governmental entities should be involved in subsidizing sports mega-events. Sydney's gains may well have come at the expense of other Australian cities, and if the federal government subsidizes the games there must be a rationale for enriching Sydney at the expense of Melbourne and other regional cities. Similarly the NFL's awarding the Super Bowl to a particular city likely has implications for other cities. A redistribution of discretionary spending from one city and region to another requires a rationale. The NFL has no compulsion for considering the distributional implications of its actions, and this may be inappropriate given that the use of local public funds for stadium projects may have interregional or even national implications.

A second reason economic impact may be exaggerated relates to what economists refer to as the "multiplier," the notion that direct spending increases induce additional rounds of spending due to increased incomes that occur as a result of additional direct spending in the "first round." If errors are made in assessing direct spending, those errors are compounded in calculating indirect spending through standard multiplier analysis. Furthermore, correct multiplier analysis includes all "leakages" from the circular flow of payments and uses multipliers that are appropriate to the event industry. Leakages may be significant depending on the state of the economy. If the host economy is at or very near full employment, for example, it may be that the labor essential to conducting the event resides in other communities where unemployment or a labor surplus exists. To the extent that this is true, then the indirect spending that constitutes the multiplier effect must be adjusted to reflect this leakage of income and subsequent spending. Siegfried and Zimbalist (2002) note that only 29% of professional athletes in their study live in the metropolitan area in which their team plays leading to very high levels of leakage from local expenditures on professional sports.

Labor is not the only factor of production that may repatriate income. If hotels experience higher than normal occupancy rates during the Super Bowl or Pro Bowl, then the question must be raised about the fraction of increased earnings that remain in the community if the hotel is a nationally owned chain.

Finally, most economic impact analyses use expenditure multipliers (rather than income multipliers) to assess the economic impact of an event. The use of expenditure multipliers is unjustified, however, as the important point is not how much business activity is created by an event but rather how the income of local residents is affected by it. In short, to assess the impact of mega-events, a balance of payments approach should be utilized. That is to say, to what extent does the event give rise to income inflows and outflows that would not occur in its absence? Since the input–output models used in the most sophisticated ex ante analyses are based on fixed relationships between inputs and outputs, such models do not account for the subtleties of full employment and capital ownership noted here.

Input–output models lend an air of authenticity and authority given their comprehensive description of fundamental economic relationships and their government origins, but they are based on a regional economy's "normal" productive relationships and patterns. During a mega-event, however, the economy within a region may be abnormal, and the inter-industry relationships identified in input-output tables may not hold. Intuitively, there is a potential inconsistency in attributing significant economic change to a mega-event while contending that fundamental productive relationships remain unaltered.

As an alternative to estimating the change in expenditures and associated changes in economic activity, those who provide goods and services directly in accommodating the event could be asked how their activity has been altered by the event. In summarizing the efficacy of this technique Davidson (1999) opined:

> The biggest problem with this producer approach is that these business managers must be able to estimate how much "extra" spending was caused by the sport event. This requires that each proprietor have a model of what would have happened during that time period had the sport event not taken place. This is an extreme requirement, which severely limits this technique.

While many potential criticisms of ex ante economic analysis exist, the real question, from a public policy perspective, is whether these estimates of the economic impact of the Super Bowl conform to actual or ex post estimates of the economic impact this and other NFL mega-events exert on their host cities? In the next section of this chapter, the ex post model methodology is discussed.

14.7 Ex Post Model Methodology and Results

Ex ante models may not provide credible estimates on the economic impact of a mega-event for the reasons cited above. An ex post or retrospective model may be useful in providing a filter through which the promises made by NFL mega-event boosters can be strained. A mega-event's impact is likely to be small relative to the overall economy, and the primary challenge for those doing a post-event audit involves isolating the event's impact. This is not a trivial task, and those who seek insight into the question of economic impact of the Super Bowl, Pro Bowl, or NFL draft should be cognizant of the challenges and deficiencies common to both ex ante and ex post analyses.

Several approaches are possible in constructing a model to estimate the impact an event has had on a city, and are suggested by past scholarly work. Mills and McDonald (1992) have provided an extensive summary of models that have been used to explain metropolitan economic growth. These theories seek to explain increases in economic activity through changes in key economic variables in the short-run (export base and neoclassical models) or the identification of long-term developments that enhance the capacity for growth in metropolitan economies (product cycle, cumulative causation, and disequilibrium dynamic adjustment models).

The task here is not to replicate explanations of metropolitan economic growth, but to use past work to help identify how much of an increase in economic activity in U.S. cities hosting NFL mega-events is attributable to any one of them. Estimating the economic impact of an NFL mega-event involves comparing the projected level of economic activity without an NFL mega event to the actual levels of economic activity that occurred in cities that have served as hosts. The success of this approach depends on the ability to identify variables that account for the variation in growth in economic activity in host cities in addition to the presence of the event.

Given the number and variety of variables found in regional growth models and the inconsistency of findings with regard to coefficient size and significance, criticisms of any single model could logically focus on the problems posed by omitted variables. Any critic, of course, can claim that a particular regression suffers from omitted-variable bias, but it is far more challenging to specify the model so as to remedy the problem. In explaining regional or metropolitan growth patterns, at least some of the omitted variable problem can be addressed through a careful specification of the independent variables. As noted above, representing relevant variables as deviations from city norms, leaves the scholar a more manageable task, namely that of identifying those factors that explain city growth after accounting for the impact of those forces that generally have affected regional or national MSA growth. It is important, for example, to model the fact that relocating a business could occur as a consequence of wages increasing in the metropolitan statistical area (MSA) under study or a slower rate of wage growth in other metropolitan statistical areas. What matters is not the absolute level of wages in any particular city, but in that city's wage relative to that of other cities.

The purpose of ex ante studies is to provide a measure of the net benefits a project or event is likely to yield. To our knowledge there is no prospective model that has the capacity for measuring the net benefits of a project relative to the next best alternative use of those funds. If one assumes that the best use of funds has always occurred prior to a mega-event, then the growth path observed for a city can be construed as optimal. If this optimal growth path, identified by the city's secular growth trend, decreases after the mega-event occurs, then the evidence does not support the hypothesis that a publicly subsidized mega-event put those public monies to the best use.

Baade and Matheson (2000), Coates and Humphreys (2002), Baade and Matheson (2006), and Feddersen et al. (2006), among others, have all estimated the economic impact of mega-events using many of the conventions discussed above in executing a retrospective examination. Mega-event audits by independent scholars often use regression analysis, and express the results in terms of statistical significance. Testing the hypothesis of whether the economic impact is meaningful different from zero makes it difficult to compare prospective and retrospective results, which usually identify economic impact estimates in currency amounts. It could be that the impact is large, but does not qualify as "meaningfully different from zero" for a large, diverse urban economy. Baade and Matheson (2006) attempted to reconcile the difference by identifying different size impacts for the Super Bowl in terms of the probability or likelihood that they would occur. The economic impact of the Super Bowl using this technique is identified in the next section of the paper along with estimates of the impact of the Pro Bowl.

14.8 Ex Post Economic Impact Estimates of NFL Mega-Events

Baade and Matheson's study in 2006 sought to predict changes in income attributable to the Super Bowl in host cities over the period 1970–2001. The cohort of cities used in their sample included seventy-three metropolitan areas that represent the largest MSAs in the United States by population over the time period 1970–2001

Table 14.4 Probabilities for various levels of economic impact induced by the super bowl

Economic impact	Probability of such an impact or greater having occurred
\$400 million	0.87%
\$392.8 million	1.00%
\$300 million	5.00%
\$252.7 million	10.00%
\$200 million	19.28%
\$100 million	47.40%
\$91.9 million	50.00%
\$0	77.00%
Negative	23.00%

Source: (Baade and Matheson 2006)

including every MSA that was among the largest sixty MSAs at some time during that period. While the choice of seventy-three cities is largely arbitrary, the list was expanded to include all metropolitan areas that have hosted the Super Bowl, cities with professional sports franchises (with the exception of Green Bay, WI), and MSAs with professional sports aspirations. Table 1.4 identifies the probability that different size economic impact estimates for the Super Bowl would occur based on the experience of the Super Bowls for the 31-year period noted above.

The figures represented in Table 14.4 were chosen based on the prevalence of booster claims in the neighborhood of \$300–400 million. The information in Table 1.4 indicates that it is not very likely, only a 5% chance, that the Super Bowl would induce an impact of a magnitude indicated most often by boosters. The likelihood that the impact would be positive is 77%, but there is a far greater chance that the impact would be less than zero, than in the \$300–400 million dollar range.

Other ex post studies also arrive at the conclusion that the NFL's mega-events generate economic benefits that are a fraction of those claimed by the league. Baade and Matheson (2000), Baade et al. (2008), and Coates (2006) all examine the impact of the Super Bowl on tax collections in the host city. The NFL has previously reported that the Super Bowl was responsible for a \$670 million increase in taxable sales in the Miami region in 1999. By contrast, Baade and Matheson (2000) found that after accounting for the impact of inflation, population growth, and normal real income growth, South Florida experienced a bump of, at most, \$36.9 million from Super Bowl XXXIII. Similarly, Coates (2006) and Baade et al. (2008) found only small retail sales or sales taxes increases from the Super Bowl.

Baumann et al. (2009) examined the economic impact of the Pro Bowl on the Hawaiian economy and while they concluded that the game generated a positive and significant effect (meaningfully different from zero in the jargon of statisticians), the amount of Hawaii Tourism Authority resources devoted to the NFL event reflected on the monopoly power of the NFL rather than on the impact of the Pro Bowl relative to other sports events such as the Hawaii Marathon or the Ironman Triathlon. All three events attracted a roughly comparable number of additional visitors to Hawaii, but significantly more public money was spent on the Pro Bowl than on either the Marathon or Triathlon. Furthermore, the authors clearly identify that Pro Bowl visitors crowd out other tourists. While 27,000 out-of-state visitors typically attended the Pro Bowl when it was held in Hawaii, the state only experienced an average increase in tourist arrivals of just under 7,000 visitors. In other words, on average 20,000 regular tourists were displaced by sports fans during the week of the Pro Bowl.

14.9 Conclusions and Policy Implications

The Super Bowl is unquestionably the most important annual sporting event held in the United States commanding the nation's attention like no other game. Civic leaders, aided by rosy economic impact statements published by the league or other sports boosters, are led to believe that the national spotlight brings with it significant monetary rewards for the host city. Economists, however, have long been skeptical of boosters' claims regarding the economic impact of mega-events such as the Super Bowl or lesser events like the Pro Bowl. While these games may be large in a gross sense, their net impact is limited by the substitution effect, crowding out, and leakages. Ex post analyses of the Super Bowl, as well as the NFL's other premier event, the Pro Bowl, suggest that the true economic impact of these games is a fraction of what is claimed. If the price tag for the right to host such an event is the construction of a new stadium with a significant public contribution of funds, then cities would be wise to view any league claims of economic largesse from the Super Bowl or Pro Bowl with suspicion. Ex ante dreams often lead to a disappointing ex post reality.

Note This paper updates and extends our previous work on this topic. Portions of this chapter draw heavily from Baade and Matheson (2006).

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Chapter 15
Behavioral Economics in the NFL

Paul B. Bursik

The purpose of this paper is to create a much needed void in the literature (Jim Thornton[1]).

15.1 Introduction

More than to create a much needed void in the sports economics literature, the main purpose of this chapter is to point out the void that is already there. It is really quite naturally the last void in a field of economics to be filled.[2] Traditional, standard theory has been picking all of the low hanging fruit for several decades now, where the economics of various sports leagues have been exposed to rigorous economic analysis. In the present case, economists have offered many satisfying economic explanations of what we observe regarding the business of the NFL and its franchises. Various answers to the generic question: "Why do they do it that way?," can be answered using the tools of the economist. Why do they employ a reverse order of finish draft? Why do they limit the number of teams? Why do they have a salary cap? The previous chapters in this volume show the results of the plowing, planting, and harvesting that have taken place in answering these and many other questions.

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[1] Jim teaches economics at Eastern Michigan University. He quipped this to Kevin Quinn and me during a conversation at one of the annual meetings of the Midwest Economics Association. I don't know if the quote originated with Jim, but that is where I heard it first.

[2] In fact, due to the relative infancy of the behavioral economics issues in the NFL, this chapter will include more unpublished work than likely appears in other chapters. This includes, with apologies, some work by the author.

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The approach employed thus far would start with basic assumptions regarding motivation (the desire to maximize profits or value) along with axioms of how people and firms *should* behave if they would like to achieve such profits or value. These assumptions are not likely to be stated, as they are widely accepted to be true with no need of being tested or verified. Based on these assumptions and the characteristics of the firm and industry economists would then build models, using deductive reasoning from the axioms that assume behavior. When we then compare the predicted outcomes of these models with actual economic outcomes, we can evaluate the models. In most cases, if we have specified the problem faced by the economic actors correctly, the data are parsimonious with the model. We pat ourselves on the back; if we are lucky to be the first to do the particular work, we get published in mainstream economic journals, and even get asked to write chapters in books. We have done a good job of figuring out the economic situation and modeled the process that *should be* taking place. When the data agree with our models, we have found simply that what is, is right. This approach has taken us incredibly far in explaining real world phenomenon involving individuals, firms, industries, and economies. The economics of sports is no exception.

But there are potential pitfalls. Since the standard approach has been so successful, some are tempted to start at the end—asserting simply that what is, must be right! If we do this, we are no longer employing economic science—we have moved into the realm of neoclassical economic religion. That is, if the quest becomes a search for a model based only on our standard assumptions, tweaked endlessly in order to be parsimonious with the data, then we are no longer trying to test hypotheses, at least in full. Sure, there is still a hypothesis that is being tested. But some explanations of results are ruled out. In particular, when a model is not confirmed by the data, the response is that we must not be including some constraint faced by the decision-makers or perhaps we have not appropriately specified the production process or costs. What many are unwilling to entertain is the idea that either the basic axioms of behavior are not a true depiction of actual behavior or systematic mistakes can be made by decision-makers even when their intentions would be consistent with the standard axioms.

Let's go back to the standard economic approach, looking at NFL teams. We assume that these teams are rational and self-interested, where that interest is assumed to be profit or enterprise value maximization. Setting aside the possibility of other motivations for now, the key word in play in the previous sentence is *rational*. There are sound reasons for thinking that rationality should rule, especially when the stakes are high. When "getting it right" matters a great deal, it seems safe to assume that decision-makers will gravitate toward what is right. And in any case, what would happen if some of them do not get it right? We have an answer for that too! If there are some irrational decision-makers, the rational ones will exploit the opportunities created by the mistakes of the former. The outcomes will still be rational.

Behavioral economics represents an expansion of the economist's tool kit. It says that the standard story falls down at times for four basic, and sometimes interrelated reasons: behavior of decision-makers in an agency relationship, irrationality in making decisions, limits to arbitrage, and the failure to adequately specify the objective of decision-makers.

15.2 Agency Problems

It is important to consider the behavior of actual decision-makers as opposed to the team as an economic entity. There are often agency relationships where an agent, some type of manager who has some decision-making authority, may have interest in acting against the interest of the principal, the owner. There is no necessary irrationality in this case, just conflicts of interest. In the present context, we need to be concerned about the decision-making of GMs and coaches. These groups might be more interested in job preservation than in maximizing profits. Hence, while the team owner may well want to maximize expected profits, the GMs and coaches may not act in the interests of the owner.

This can be an especially large problem in sports when the ire of fans can play a role in determining the longevity of a coach or GM, with fans sometimes being impatient and possibly irrational. For instance, suppose that a coach is faced with a decision of whether or not to go for a two point conversion after scoring a touchdown in the closing seconds to bring his team within a one point margin. The coach might *think* that the best play is to go for two, but might be inclined to kick the extra point and take the team's chances in overtime if that decision is less likely to draw criticism. If the outcome of a coach's decision is likely going to be a deciding factor in the game, many coaches may be inclined to do what is safe over what is optimal. Likewise, in just about any circumstance when conventional wisdom clearly suggests a particular decision, it will be difficult for a coach to deviate even when the coach thinks another alternative is optimal. This could well be at play with the fourth down problem, which will be discussed later.

15.3 Irrationality

Next, we need to consider the possibility that teams might make consistent mistakes when making decisions. In finance, we know that individuals make consistent, predictable mistakes even in cases where the stakes are very high. Individuals tend to rely on various heuristics in making investment decisions, leading them to a number of wealth decreasing outcomes. Among other tendencies, individuals tend to save too little, diversify too little, and be predisposed to riding losing investments while liquidating winning investments. We tend to be biased toward investing too much in familiar companies (including an alarming tendency of going "all in" on our own employer in our 401k accounts), we have very biased memories of our own past investment results (in our world of joint memories, all of the investors are above average), and we are inclined to see patterns in essentially random movements in prices.

In finance it has become quite mainstream to think about behavioral issues involving irrationality.[3,4] There was really no choice. Facts are stubborn things, and these facts are most certainly not consistent with rational, wealth-maximizing decision-making. No amount of tinkering with a model is going to explain why some of these tendencies are rational. Instead, finance has largely adopted a healthy balance between positive and normative economics. We have financial theory based on standard, neoclassical assumptions. That normative theory provides a roadmap for how investors *should behave* in order to maximize utility when making investment decisions. But we also need to study how investors *do behave*, especially when the tendency is to make mistakes. By employing such a positive analysis, we can learn how to avoid common human mistakes in our investment decisions. We do not simply throw out the theory. This is a common misconception. The idea is not to have a model of "stupidity" to replace the model of rationality, though there are some models such as prospect theory that help to provide a bona fide model of behavior at odds with standard theory. Instead, when we find empirical phenomenon inconsistent with standard theory, we search for more plausible explanations of those departures from rationality. Often this means drawing from research in cognitive psychology as well as social psychology. There is a necessary and large consequence of this approach. When we observe market outcomes we can no longer just assume that "what is, is right."

In finance, the willingness to think about behavioral issues, potential irrational behavior, and market inefficiency was both a natural progression and an exercise in self-interest. It only takes one Fama (or perhaps just a few) to say "stock prices are right, buy index funds". But it takes many Shillers and Thalers to test the uncountable ways that there could be a departure from efficiency. So far in sports economics, the Famas have been much busier than the Thalers.[5] A very natural progression. Standard theory, just like the efficient capital market hypothesis, explains a lot. But eventually if we sit enough assistant professors in front of computers with lots of data, some anomalies start to show up. To handle those anomalies, we may need to employ additional tools. Thinking that cognitive errors, heuristic biases, and other common behavioral mistakes can play a role in determining market outcomes is one such set of tools. For the unfamiliar, a review of a few recurrent decision-making problems is in order.

[3] In the interest of full disclosure, the author teaches finance. So examples from finance result from the author's familiarity with that literature.

[4] Closer to home for the NFL, an internet search including the terms NFL and irrational will produce a wall of literature regarding inefficiencies in the wagering markets for the NFL. Here again, departures from rationality are too obvious to ignore, and cannot easily be explained away.

[5] Perhaps a bad example, since Thaler's work on the draft has been an important contribution to this literature. It turns out that for behavioral finance professors, low hanging behavioral fruit is now much more plentiful outside of finance than inside of finance—including in studies of the economics of sports!

15.4 Some Behavioral Tendencies

Research in psychology indicates that an overarching problem with humans is that we are subject to *overconfidence*. Even when our information is very limited, we tend to trust our abilities to make judgments more than is warranted. The vast majority of us think that we are above average drivers, above average investors, and have above average intelligence (see, for instance, Svenson 1981; Statman et al. 2006). We form strong opinions, and then stubbornly stick to them even in the face of evidence that goes against our beliefs. To keep up this feeling of superiority, we tend to remember the past with a great amount of filtering; for example, we remember our past investing results as better than they really were (see, for instance, Goetzmann and Peles 1997). This is an example of *cognitive dissonance* (see Akerlof and Dickens 1982). Not only do we look at the past with biased eyes, but when we have an opinion we tend to display *confirmation bias*, where we notice those things that confirm our previous view, but ignore or discount evidence that runs contrary to our view. In fact, even extreme views can get more strongly held when we have successfully "confirmed" that we are correct.

In order to deal with complex decisions and cognitive limitations, humans have developed tendencies to use some basic rules of heuristic simplification. These rules often serve us very well. Recognizing dangerous situations and reacting quickly (fight or flight) can be a very good survival skill. But sometimes the rules that our brains employ lead to biases in decision-making, resulting in predictable errors. Here are a few of the commonly observed biases.

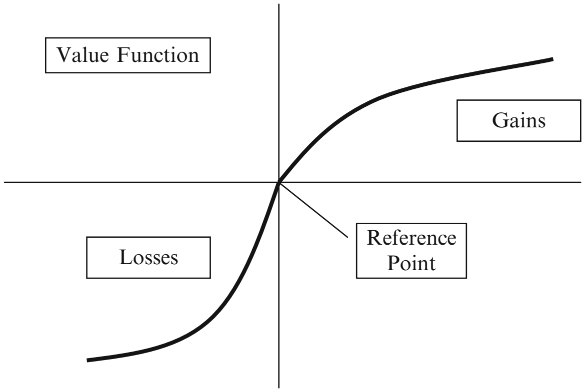
Representative bias is when we judge based on stereotypes. We may infer that a good company is also a good investment. We may be disposed to thinking that a clean car runs well. We may rush to purchase shares in a mutual fund that did well in the previous quarter thinking that past winners will be future winners, even though evidence suggests that this is not the case (see Lakonishok et al. 1994; De Bondt 1993). This may be a factor in player selection problems in drawing inferences about future performance based on measures that have little to do with future performance.

Familiarity bias is the tendency to view familiar things as being superior to less familiar things. This helps to explain the alarming tendency of investors to allocate way too much of their retirement savings to the stock of their employer. This may play a role in the decision of whether to re-sign, and how much to pay, the team's own players that qualify for free agency.

The *Ellsberg Paradox* is related to an aversion to ambiguity (see Fox and Tversky 1995). In cases of equal probabilities, individuals may view probabilities differently when some of the outcomes are more ambiguous. This can lead to excessive conservatism when some outcomes are not well understood (Fig. 15.1).

Prospect theory is probably the most developed model in behavioral economics (Kahneman and Tversky 1979). It provides a description of the way individuals frame and evaluate decisions. It suggests that when considering gains and losses from some reference point, that utility changes are represented by an S-shaped curve through the origin. The curve is steeper in the realm of losses than gains; thus, the

Fig. 15.1 Prospect theory value function



disutility assorted with a loss is larger than the utility associated with a gain. Further, the increase in utility from turning a loss into a gain is larger than the increase in utility from further gains.

Prospect theory has helped to explain the tendency of investors to be disposed to riding losing investments and dumping winning investments—a phenomenon called the *disposition effect* (Shefrin and Statman 2000; Thaler et al. 1997). Financial advisers note that investors often suffer from "geteventitis." This may well be a factor in the decision of who to play—a high draft pick or a low draft pick or undrafted free agent. Even if the player without the draft pedigree is performing better, prospect theory would predict that a team may choose to "ride the loser" in an effort to realize the prior expected value of that player based on draft position.

In addition to these cognitive errors, or even compounding such errors are social dynamics. In investing, portfolio decisions are often related to discussions with other investors; further, when an investor buys a stock, that investor is likely to talk to many other people about that company (Shiller and Pound 1989). NFL owners, GMs, and coaches are a relatively small group of individuals who know each other, have similar backgrounds, and have lots of interactions. In such cases, any problems in decision-making are less likely to have the kind of scrutiny we would expect to see in a less "clubby" environment. In particular, it is more possible that various tidbits of conventional wisdom can develop that are both incorrect and standard practice. Such conventional wisdom may change over time, but often very slowly.

15.5 Limits to Arbitrage

One of the common retorts of the defenders of unsullied neoclassical theory is that any departures from rationality on the part of some decision-makers will make for free lunches, which will be readily consumed by the dominant (or even outnumbered) rational decision-makers. The effect will be that market outcomes, including prices, will be the same that would have existed if everyone was rational. That is, the irrationality will be arbitraged away, leaving outcomes unaffected. There are cases where such a story would clearly prevail. Regularly playing games of chance against irrational players involves the gradual transfer of chips or money from the irrational to the rational, for instance. But not all mistakes give rise to free lunches. Going back to investments, if you make obvious risk/return mistakes in allocating your retirement assets it does not give me any obvious, easy, riskless profit opportunity. Sure, I can try to start a business to do consulting on retirement fund allocation where I can earn money while eliminating your errors. Of course, many such businesses exist and have existed while we have observed these mistakes. Arbitrage opportunities are often limited even when mistakes abound.

15.6 What Is/Are the Objective(s) of Team Owners?

We assume that team owners are like owners of other businesses. They are interested in profit or wealth maximization. We further tend to assume that profits will be maximized through winning—or at least teams will want to win as much as possible, given the resources that they choose to employ. Thus, whatever investments are made in player and coaching talent, they will want to maximize the chance of winning with those resources. What if we are wrong about this? What if some or all teams have other objectives that impact decisions in ways that lead to outcomes that are at odds with predictions from our assumed objective of the firm? Often this possibility would constitute an alternative explanation to results that would otherwise constitute an example of irrationality.

15.7 Filling the Void: The Existing Work

There have been those who have been beating the behavioral drum in sports economics for a while now. Michael Lewis' (2004) *Moneyball* created quite a stir. Among others, Hakes and Sauer showed that there was indeed an exploitable anomaly in the baseball labor market that was later eliminated through more rational pricing of player skills (Hakes and Sauer 2007). Berri and Schmidt have likewise been prolific in both books and journals in advancing the idea that sports teams and leagues are not always getting things right (Berri and Schmidt 2010).

Even some of those who would not like to be lumped in with behavioral heretics could be said to be contributing to the effort in a sense. In particular, several papers dealing with competitive balance issues in sports assert various ideals when it comes to win distributions in leagues. These represent assertions about what we *should see* but often *do not see* when it comes to actual win distributions, a pleasant departure from the "what is right" idea. Yet, many are less comfortable in looking for behavioral explanations about why actual distributions depart significantly from ideal distributions.

15.8 Problems with Strategic Decisions on the Field

15.8.1 The Fourth Down Problem

David Romer investigated the decision to kick, either a punt or a field goal attempt, as opposed to going for it on fourth down (Romer 2006). For Romer, this amounts to a test of whether or not firms are maximizing expected profit with respect to this decision. What he finds is that teams display an amazing degree of conservatism and fail to maximize. Ultimately, Romer evaluates the efficacy of a team's decision in 2,672 fourth down situations. Out of these, his analysis concludes that the correct decision was to kick in 1,604 of those cases; teams behaved correctly in nearly all of these cases, kicking 1,595 times. But in the 1,068 cases where his analysis suggested going for it, teams still kicked the ball in 959 cases. Romer also contends that despite the small number of plays involved in such decisions for a team, correcting the incorrect decisions would imply about one-third of a win during a full season—not a trivial effect.

Romer offers several competing or complimentary explanations of this inefficient behavior. First, conservatism may be resulting from the variability of immediate results being much larger when going for it than through kicking—not making it on fourth down *seems* riskier since the outcomes appear to be more extreme. As a result, teams may display risk aversion over these decisions that are at odds with the risk/reward proposition for winning the game. This could come from fans who value such conservatism over winning, from owners who value such conservatism over winning, or from coaches who may be acting in the interests of job preservation in an agency relationship. These explanations do not require departure from rationality. Instead, Romer argues that these explanations, if true, would require a rethinking of the a priori objective function of teams, along with the varying motives of owners and coaches.

Romer's second set of potential explanations focus on irrationality. In particular, even if teams want to maximize expected profits, they may be overly reliant on experience and intuition as opposed to a more robust examination of the fourth down decision. Romer cites tendencies from various literatures indicating excessive conservatism in cases where probabilities are ambiguous, including the Ellsberg Paradox. In this case, the conservatism is caused by an improper processing of the decision.

Romer does not draw firm conclusions about which of these behavioral problems dominates.

> Unfortunately, there is little evidence about whether conservative behaviors arise because individuals have nonstandard objective functions or because they are imperfect maximizers. For example, individuals may exhibit risk aversion over probabilities either because they genuinely dislike uncertainty about probabilities or because they misapply their usual rules of thumb to settings where risks involves probabilities rather than payoffs (Romer 2006).

Romer does add an interesting point about finding out which of these factors are more important in the explanation.

> The hypothesis of nonstandard objective functions and imperfect optimization do, however, make different predictions about the future evolution of football strategy. If conservative choices stem from preferences concerning the probability of winning during the game, behavior will not change. But if they stem from imperfect optimization, then trial and error, increased availability of data, greater computing power, and the development of formal analyses of strategy will cause behavior to move toward victory-maximizing choices. Thus the future evolution of football strategy will provide evidence about the merits of these two competing explanations of systematic departures from the predictions of models to complete optimization of simple objective functions (Romer 2006).

Romer's final point is very important to many studies in behavioral research. To the extent that behavioral anomalies are driven by irrational factors, shining a light on the irrationality should eliminate the anomalous behavior over time as long as the objective really is to maximize expected profit. This is consistent with the work that Hakes and Sauer did regarding inefficiencies asserted in *Moneyball*. They found that, indeed, there did exist exploitable inefficiencies in the baseball labor market; they also found that these anomalies were rather short-lived. This has been the history of many observed financial anomalies in the stock market as well.

Kicking on most fourth down situations, while probably flawed, is still conventional wisdom. Going against conventional wisdom can be dangerous, risking the ire of fans, media, and ownership. In the 2009 NFL season, Bill Belichek, the head coach of the New England Patriots (and who is known to have read the Romer article), decided to go for it on 4th and 2 from the Patriots' own 28 yard line late in a game against the Colts when leading by 6 points. They did not convert, but the Colts did, with Peyton Manning throwing a winning touchdown pass in the closing seconds. By the numbers, it was probably the correct move; but Belichek was widely criticized for going against what, according to conventional wisdom, would have been a "no brainer" decision to punt the ball away.

15.8.2 Play Selection Problems

Kovash and Levitt investigate the extent to which play selection, boiled down to a choice of whether to run or pass on a particular play, follows the predictions about how a two player game should optimally be played according to game theory (Kovash and Levitt 2009). They find that teams do not tend to play the game optimally. Instead, they show a strong tendency to alternate runs and passes, especially when the previous play was unsuccessful, with such negative serial correlation being a common deviation from optimality in the literature. They conclude that these mistakes are costly for teams—amounting to about one point per game on average.

15.9 Player Evaluation Problems and the Draft

Several studies have called into question the efficiency of the player evaluation market, in particular as it applies to the annual college player entry draft.

15.9.1 *Overvaluing the Right to Choose*

Massey and Thaler estimate the implied value of draft picks through examination of draft pick trades (Massey and Thaler 2006). The implied value of picks should be strongly associated with the subsequent revealed value of such picks through on-field productivity. Further, the compensation based on draft position should be strongly associated with productivity. These "should be's" assume that there are no biases or mistakes in the evaluation of player talent in this market. Massey and Thaler develop, what they call an "over-determined" hypothesis, arising from an "embarrassment of riches" from the behavioral literature that predicts inefficiencies in the NFL draft pick market.

They predict problems arising from several fronts. First is the tendency of intuitive predictions (in this case of player performance in the NFL) to be insufficiently regressive—resulting in predictions to be too extreme based on available information (Kahneman and Tversky 1973). Next, overconfidence is likely to cause teams to think that they can predict subsequent performance and overvalue the right to choose early to an unwarranted extent. Further, this unwarranted confidence actually tends to get larger with more information (Oskamp 1965). The draft market could also be subject to the winner's curse, where winning bids are often based on overly rosy predictions. Finally, they posit that draft decisions could be prone to the false consensus effect, which is the tendency to overestimate the extent to which other's beliefs and preferences match your own (Ross et al. 1977). If this effect is at work, teams could overvalue the ability to move up in the draft, even by a few positions, in order to get a player that is assumed to be coveted similarly by other teams. All of these tendencies, or any combination of them, lead the authors to predict that the right to choose earlier in the draft will be overvalued by teams.

The results confirm their hypothesis. They estimate the surplus value of players, a measure of performance in excess of pay, and find that it actually rises throughout the first round of the draft, peaking a bit before the middle of the second round of the draft. This is a rather startling conclusion: the worst pick in the first round of the draft is actually the first pick overall. This is not to suggest that the first overall pick tends to be the worst player; to the contrary, the player tends to be the most productive. But the first pick also tends to be the worst value in the first round when considering both the value of the pick and the salary paid to the player. In essence, the draft value curve and the compensation curve as we move through the draft implies a highly refined ability to discern differences between players. The actual differences in performance are much smaller than the implied ability to discern such performance differentials.

15.9.2 Biases in Drafting Based on School Visibility

Hendricks, DeBrock, and Koenker are concerned about information problems in the labor market, and focus on the NFL labor market due to the unique opportunities that it affords (Hendricks et al. 2003). It is a market where information about those entering the market is quite good in comparison with other labor markets, and where subsequent outcomes (for those employed by the team as well as those not employed by the team, but hired by other NFL teams) are much more rich than in most labor markets. They argue that because of the quality of the information, that this should be a market that shows a great deal of efficiency. To the contrary, they find systematic biases at play in the draft. In the first rounds of the draft, teams have a tendency to put too high a value on players who come from visible programs—too high given the subsequent performance of those players. In late rounds, teams reverse the bias, and then undervalue players from top programs in their search for "diamonds in the rough" from less visible programs.

These tendencies could possibly be explained by the representative bias—better school pedigrees being representative of better NFL performance beyond that justified by the data. The familiarity bias could also be at work. More visible players may come to be overvalued by teams because they are more familiar.

15.9.3 Draft Position, Playing Time, and Productivity

Quinn, Geier, and Berkowitz investigate various aspects of player productivity with respect to draft position, focusing on quarterbacks (Quinn et al. 2007). The central finding is that draft position is highly correlated with playing time, but not highly correlated with player productivity. Several behavioral tendencies appear to be at play. Besides overconfidence in predicting differential success in similar athletes, prospect theory may be useful in explaining why higher drafted players are afforded more opportunities to play in spite of performance.

Suppose that a team has two draftees who play the same position, and that initially the later draft pick has performed better than the higher draft pick (see Fig. 15.2). If the team suffers from some of the same biases that inflict investors, we can make several predictions about the team's behavior. First, given the differences in "draft" expenditures as well as salary, the higher drafted player will have generated a loss from the expected value inherent in such a high pick (the likely reference point for the team), while the later drafted player will have a corresponding gain from his reference point. But note the asymmetry. The potential gain in value for the high pick to live up to expectations (get back to even) is considerably larger than any additional loss associated with further disappointment since the value function flattens out as losses mount. Additionally, giving the higher draft pick more playing time means taking playing time away from another player, in this case a later draft pick who has exceeded expectations. But notice that once again, the benefit from being proven correct about the high pick (eliminating the loss) would be far more

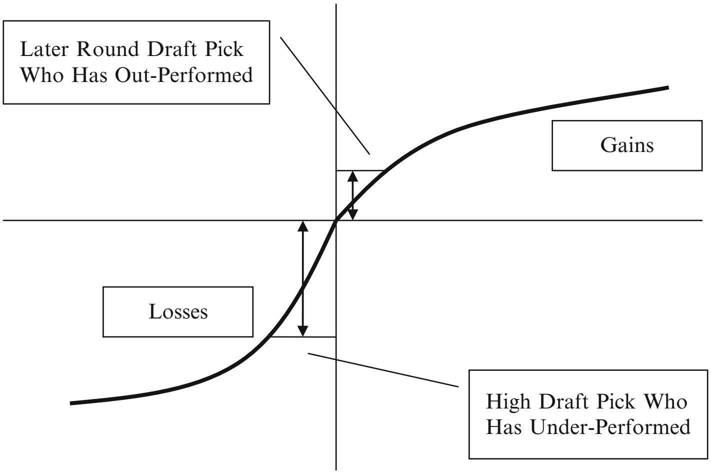


Fig. 15.2 Prospect theory value function

valuable than keeping the gain (or even adding to the gain) for the later pick. Perhaps NFL teams tend to suffer from the same geteventitis disease that inflicts many individual investors, riding their losers and suffering the consequences.

15.9.4 Extreme Impatience and the Consequences: Trading Picks Across Seasons

Bursik builds on the work of Massey and Thaler, who found that draft pick trades across seasons implied a very high discount rate for the team wanted to "trade up" and obtain one or more picks in the current year for one or more picks in the following year's draft (Bursik 2009). The starting point is to find the value of draft picks by draft pick number. For quite a few years, NFL front offices have consulted similar draft value charts when making trades.[6] These values are relatively close to the values implied from trades as estimated by Massey and Thaler. In addition to valuing same-year trades of draft picks, these values can also give us a glimpse of the implied discount rate that teams have when trading between years. Two examples are given below.[7]

Example #1: During the 1998 draft, Tampa Bay acquired Baltimore's fourth round pick (the 104th pick overall); in exchange, Baltimore obtained the rights to Tampa Bay's third round pick in 1999 (which ended up being the 70th overall selection).

[6] A popular version of the draft value chart is shown as in the Appendix.

[7] See the previously referenced draft value chart.

Table 15.1 Discount rates by year including all trades

Year	# of trades	Value this year	Value next year	Discount rate (%)
1994	1	140	320	128.6
1995	7	1,135.6	1,893.2	66.7
1996	3	535.2	1,096.2	104.8
1997	3	146.7	365.2	148.9
1998	5	416.6	1,432.4	243.8
1999	6	591.2	4,896.2	728.2
2000	4	83.5	334	300.0
2001	3	206	414	101.0
2002	3	70.5	204	189.4
2003	5	798.35	1,768.4	121.5
2004	1	935	1,234	32.0
2005	7	863.5	1,518.4	75.8
2006	1	1.6	10	525.0
2007	6	1,508.3	3,530	134.0
2008	7	726.1	1,489.7	105.2
Totals	62	6,200.65	16,831.1	171.4

Note: The difference between the values from 1 year to the next is the value exchange between years

According to the draft value chart, the 104th pick is worth 86 points and the 70th pick is worth 240 points. Baltimore was able to obtain an extra $240-86=154$ draft value points by being willing to wait 1 year to make a draft selection. So the 1 year investment by Baltimore yielded a return of just over 179%—the same as the cost to Tampa Bay for their impatience.

Example #2: During the 2003 draft, Baltimore acquired a New England first round pick (the 19th pick overall); in exchange, New England obtained Baltimore's second round pick in 2003 (41st overall) along with their first round pick in 2004 (which ended up being the 21st overall). The difference between pick 19 (875 points) and pick 41 (490 points) is 385. Thus, New England parted with 385 points in 2003 and got back 800 points (the value of pick 21) 1 year later. They gained 415 points with a 385 point investment, yielding a rate of return of about 108%.

Individual trades are interesting, but of more interest are the average discount rates across all trades. These are given in Table 15.1, broken down by year and with totals on the bottom.

The average discount rate is thus 171.4%, indicating a large degree of impatience for some and tremendous opportunity for others. While the degree of impatience changes over time with the uncertain outcomes of future draft positions, impatience remains the rule. Also, if we were to try to summarize these trades in terms of a one-for-one metric, the "traders down" are giving up about 100 points this year (6200.65/62) for 271 points next year (16831.1/62). This corresponds to the 100th player in the draft this year (normally the fourth player in the fourth round) in exchange for the 64th player the following year (normally the last pick in the second round).

The high discount rate is probably interesting all by itself, but even more interesting if it leads to divergent results among those trading up and those trading down.

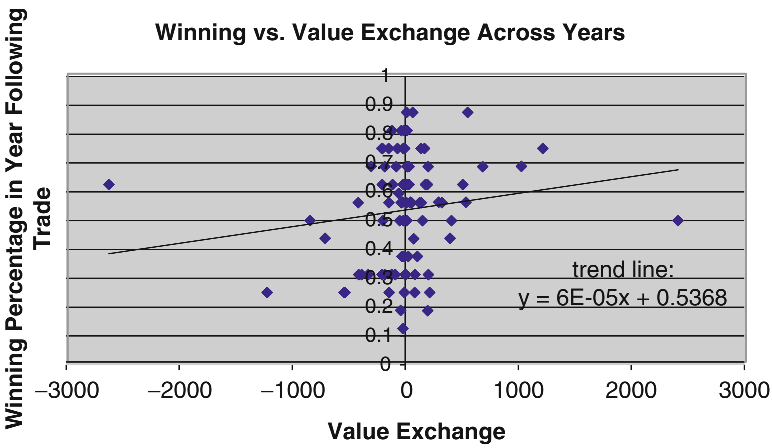


Fig. 15.3 Winning vs. value exchange across draft years

In the finance literature, statistical significance is interesting; economic significance is important. The difference, in efficient market research, concerns whether or not some anomalous pattern of security returns is large enough to create an exploitable profit opportunity.

So the discount rate is high; but does it matter? The first question is to ask who, on average, should benefit in the season immediately following such a trade. The answer is not obvious. It might seem that it should favor the team obtaining another pick this year. But with a relevant salary cap in play, trading away a pick this year does not mean that the team's roster contains one less player. If a team uses its entire salary cap, it also does not mean that one more later pick makes the team instead of an earlier pick—it normally implies that the team will spend more money on veteran players. Since newly drafted rookies are often not quite ready for prime time, it is questionable who would have an immediate boost in performance with an extra draft pick changing hands, the team with an extra rookie or the team with a higher amount to spend on veterans[8] (Fig. 15.3).

The picture indicates that the advantage goes to the teams trading down in the season following the trade.[9] This is confirmed by the numbers in Table 15.2. This has important implications for those teams who might contemplate trading up. If the intention is to draft a player that will help to put the team "over the top," history would show that this is not the best strategy. Indeed, the opposite should be done. To get better in the short term, perhaps it would be a winning bet to trade away current for future picks and use the freed-up money to invest in veterans who can

[8] Of course, a team could choose not to spend the extra money on veterans. If the impact is solely to have one more (later) pick or undrafted free agent make the team for those patient teams that are trading down, we would expect those who trade up to have the immediate advantage in terms of on-field performance.

[9] The year of the trade would mean the season commencing in the same year as the draft, about 4 months after the draft.

Table 15.2 Winning percentages before and after

Weighted winning percentage	Year before trade (%)	Year of trade (%)	Year after trade (%)	Average of 3 years following (%)
Trading up	48.8	38.4	47.5	42.9
Trading down	49.0	60.4	58.8	59.3

help the team now. This discussion creates a bit of a puzzle. Trading-up comes at a high cost and the need to show much impatience. Yet that impatience in not rewarded with short-term results.

What if we go just a bit further down the road? We might expect that the additional pick would help, but only with a delay to allow the player to get a bit of experience and climb the NFL learning curve. So we next look at the results in the following year (the season starting about 16 months following the trade).

Once again, the data show very divergent results for those trading up (with a weighted winning percentage of 47.5%) and those trading down (whose average winning percentage is 58.8%). The larger a team's activity in this market, the better for teams that traded down and the worse for teams that traded up.

One additional point worth noting is the apparent 1-year improvement of teams trading up in the year after the trade according to the weighted winning percentage. Perhaps this makes sense given the results in the year of the trade. If teams trading down are substituting veterans for rookies in the year of the trade, just the opposite would be the case in the following year when the team who had traded up now has at least one fewer pick to make in the next season. If they are now still spending the same, but only with more seasoned players, it may make some sense that they would improve a bit.

Finally, consider the results over the three seasons following the trade, including one more season in the comparison. The story remains unchanged. The teams trading down do much better (59.3% winning percentage) than those trading up (42.9%), and the difference in performance persists (Fig. 15.4).

Why are teams so impatient? Both the behavioral literature and the agency literature document problems with myopic, short-sighted decision-making tendencies. Due to the uncertainty associated with future draft position and the players available in the future year's draft, loss averse GMs may overvalue draft picks in the current year as opposed to a future year. Also, GMs who may view their tenure as potentially short-lived may likewise overvalue current year draft picks over future draft picks. Whatever the reason for the myopia, it appears to be self-defeating, even if it arises from the self-interested impulse of a GM in an agency relationship. The data show that if trading up is aimed at maximizing short-term winning, even at the expense of longer-term results, the effort does not achieve the desired result.

Another alternative is that teams are not adequately thinking about the portfolio effects on the overall team of draft day trades. The finance literature contains many examples of investors failing to think about their investment portfolios in concert with modern portfolio theory. Instead, they tend to compartmentalize various areas of investments according to different investment objectives. In constructing a team, GMs need to be concerned with players obtained via the entry draft and also the free

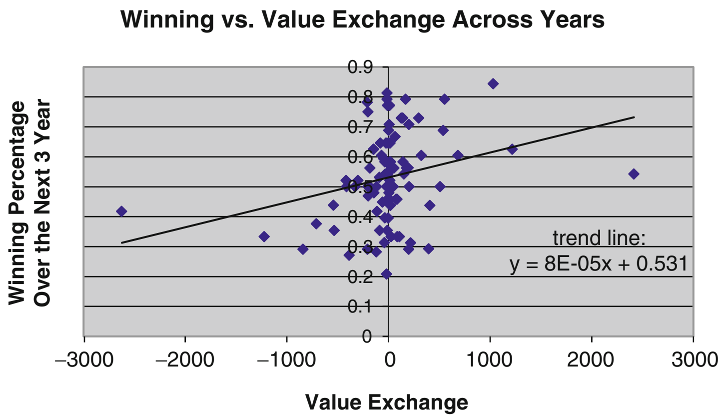


Fig. 15.4 Winning vs. value exchange across draft years

agent market. These markets are active at different times, creating a greater chance that implications of draft day decisions on overall team construction may not be adequately incorporated into those decisions. In particular, teams may believe that maximizing player talent in the current draft will maximize short-term results, ignoring that additional draft picks in the current year may mean fewer seasoned players on the roster who may be more helpful in generating wins.

15.10 Filling the Remaining Void and Creating New Much Needed Voids in the Literature

The papers discussed in this chapter indicate that there are various entry points for those who wish to add to the behavioral economics literature related to the NFL. Those whose specialty is behavioral economics can find fertile ground to work in line with the work of Massey and Thaler. They start with the predictions that come from the behavioral economics literature. From their perspective, they have demonstrated that rampant decision errors documented elsewhere are also present in the NFL draft. For a behavioral economist, these are not anomalies. The results confirm what would be predicted—errors in decision-making.

The Kovash and Levitt paper represents another way of adding to the literature. They consider whether the run/pass decision is prone to the same violations of optimal game playing as found in other sports where similar decision-making errors have been documented. The Hendricks, DeBrock, and Koenker paper is a good example of an anomaly that cries out for potential behavioral explanations. The same is true of the Quinn, Geier, and Berkowitz paper. Both uncover evidence of inefficiencies. The next step is to offer plausible explanations of those inefficiencies, perhaps from the behavioral economics or cognitive psychology literatures. The Bursik paper is an example of a literature building on itself. It extends the work of Massey and Thaler in a direction suggested by that existing work.

While I may be biased and overconfident in making predictions, it does seem likely that the behavioral literature will comingle with the sports economics literature to a greater extent in the future. This has been the progression of several other areas of economics and finance. Relevant data are available to text hypotheses. People are interested. The ultimate value of much of this literature goes back to Romer's point. To the extent that teams are making mistakes that produce results at odds with maximizing expected profits, the spotlight shining on such anomalies should tend to make them short-lived.

15.11 Appendix: NFL Draft Value Chart with Pick Numbers and Values

Pk#	Val	Pk#	Val	Pk#	Val	Pk#	Val	Pk#	Val	Pk#	Val	Pk#	Val
1	3,000	33	580	65	265	97	112	129	43	161	28	193	15.2
2	2,600	34	560	66	260	98	108	130	42	162	27.6	194	14.8
3	2,200	35	550	67	255	99	104	131	41	163	27.2	195	14.4
4	1,800	36	540	68	250	100	100	132	40	164	26.8	196	14
5	1,700	37	530	69	245	101	96	133	39.5	165	26.4	197	13.6
6	1,600	38	520	70	240	102	92	134	39	166	26	198	13.2
7	1,500	39	510	71	235	103	88	135	38.5	167	25.6	199	12.8
8	1,400	40	500	72	230	104	86	136	38	168	25.2	200	12.4
9	1,350	41	490	73	225	105	84	137	37.5	169	24.8	201	12
10	1,300	42	480	74	220	106	82	138	37	170	24.4	202	11.6
11	1,250	43	470	75	215	107	80	139	36.5	171	24	203	11.2
12	1,200	44	460	76	210	108	78	140	36	172	23.6	204	10.8
13	1,150	45	450	77	205	109	76	141	35.5	173	23.2	205	10.4
14	1,100	46	440	78	200	110	74	142	35	174	22.8	206	10
15	1,050	47	430	79	195	111	72	143	34.5	175	22.4	207	9.6
16	1,000	48	420	80	190	112	70	144	34	176	22	208	9.2
17	950	49	410	81	185	113	68	145	33.5	177	21.6	209	8.8
18	900	50	400	82	180	114	66	146	33	178	21.2	210	8.4
19	875	51	390	83	175	115	64	147	32.6	179	20.8	211	8
20	850	52	380	84	170	116	62	148	32.2	180	20.4	212	7.6
21	800	53	370	85	165	117	60	149	31.8	181	20	213	7.2
22	780	54	360	86	160	118	58	150	31.4	182	19.6	214	6.8
23	760	55	350	87	155	119	56	151	31	183	19.2	215	6.4
24	740	56	340	88	150	120	54	152	31.8	184	18.8	216	6
25	720	57	330	89	145	121	52	153	31.2	185	18.4	217	5.6
26	700	58	320	90	140	122	50	154	30.8	186	18	218	5.2
27	680	59	310	91	136	123	49	155	30.4	187	17.6	219	4.8
28	660	60	300	92	132	124	48	156	30	188	17.2	220	4.4
29	640	61	292	93	128	125	47	157	29.6	189	16.8	221	4
30	620	62	284	94	124	126	46	158	29.2	190	16.4	222	3.6
31	600	63	276	95	120	127	45	159	28.8	191	16	223	3.3
32	590	64	270	96	116	128	44	160	28.4	192	15.6	224	3

Source: ESPN

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Chapter 16
The NFL and Antitrust Law

Adam Winters

16.1 Introduction

16.1.1 Combatants and Comrades

Sports are, at their essence and most accessible, about *competition*. For most of us, our inlet to sports is experienced through viewing (or occasional participation in) the fierce competition between combatants on a field of play, with each side pushing itself and its opponent to the bounds of their respective abilities in the pursuit of victory. This perspective, however, reveals only one aspect of the exchange, albeit an exciting one. A broader evaluation of sport, especially the business of professional sports, permits us to see that the contest on the field is but one manifestation of the "competition" at play, a primary output following from the outcome of competition in many diverse spheres.

Indeed, with respect to a sport like professional football in the United States, the relevant competition extends far outside the lines on the field (and the battle between two individual teams) to many different fronts: among teams in the input markets for the best players, coaches, stadia, and media, among teams and between sports leagues in the output markets to attract consumer dollars, within the input and output markets among vendors and suppliers to the teams and the leagues, between the competing interests of team owners among themselves and with their players, among municipalities for the opportunity to play host to franchises and competitions, and so on and so forth. Broadening our view even a bit more and we see that a delivery mechanism for a sports experience like the National Football

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League (or the "NFL"), as a massively complex business enterprise which reaches all 50 states and countries around the globe, is also influenced by the competing goals, roles, and interests of the United States Congress, state governments, courts at all levels, and the various legal and regulatory structures with which the NFL's activities from time to time intersect.

While competition in the context of the NFL is an idea with which most of us find intuitive familiarity, we also need to recognize that sports generally, and the NFL specifically, necessarily involve significant *cooperation* between those who are combatants in other areas, in a real or metaphorical sense, as an element to the delivery of the product of organized athletic competition. For instance, without an agreed upon set of on-field rules, an NFL game could not take place. Moreover, if NFL teams were allowed little or no cooperation, as is the case in most industries, off-the-field competition may result in a suboptimal number of teams left standing to play one another *on* the field. Indeed, courts have noted that leagues and organizations such as the NFL are really selling "competition itself"[1] and that "[i]f all teams should compete as hard as they can in a business way, the stronger teams would be likely to drive the weaker ones into financial failure,"[2] and eventually such vigorous business competition would sow the seeds of destruction of the league itself, as "without a league no team can operate profitably."[3] These realities give professional sports a unique place with respect to their treatment by our competition laws.

16.1.2 Key Questions and Issues to Be Addressed

The overarching issues to be addressed in this chapter are (1) the quality and texture of the interaction between NFL teams (including an examination of their individual and collective goals), (2) an examination of the background and current landscape of our current antitrust and competition laws, focusing on their relevance to professional sports, (3) the interplay between the NFL, in all of its forms and functions, and such framework of competition laws and policy as we grapple with how much cooperation is permissible (and even *necessary*) to allow the delivery of the product of NFL football and how much is violative of our notions regarding business competitors, and (4) the economic outcomes and implications from our legal system's attempts to address issues which arise in this struggle.

Before diving in, however, a few words about the structure and progression of the chapter. We will begin with an analysis of certain threshold questions regarding what the NFL and its teams are ultimately competing for and the basic ways in

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[1] National Collegiate Athletic Ass'n. Board of Regents of University of Oklahoma, 468 U.S. 85, 101 (1984).

[2] United States v. National Football League, 116F. Supp. 319, 323 (E.D. Pa. 1953).

[3] *Id*. Simon Rottenberg was the first to tackle these concepts in his seminal 1956 article titled "The baseball players' labor market" (J Polit Econ 64:242).

which sports economists think about them. This chapter will proceed to consider the basic industrial organization of the NFL and discuss it in terms of the outputs produced, the inputs employed, and the relationship between the teams and the league. Next, this chapter will provide an introduction to competition law and policy in the United States, specifically federal antitrust laws and judicial decisions, and their impact on the world of sports. Additionally, this chapter will extend the discussion of antitrust principles to analyze the economic implications of certain seminal events in the history of the NFL, including passage of The Sports Broadcast Act, NFL-AFL merger, and the *LA/Oakland Raiders*, *USFL* and *American Needle* court cases. Finally, the chapter will end with a brief summary and suggestions for future research and discussion.

We will first turn to an examination of the various optimization functions used by economists, and their application to the NFL, as a preface to our discussion of the NFL's organization and an introduction to antitrust concepts. These optimization functions, and how effectively (or not) they describe the motivations and behavior of NFL teams will be helpful to keep in mind as we proceed to consider the appropriate treatment and ramifications of their individual and collective decisions. Said differently, if the ultimate goal of an NFL franchise is to maximize profit, should that change the scrutiny we give their decisions to act collectively, because that motivation may suggest more of a risk that collective decision-making is simply a vehicle to extract more profit rather than incidental to the delivery of the product of NFL football? Would that scrutiny change if we determine the ultimate goal of an NFL franchise and its owner is to maximize wins?

16.2 Optimization Functions in the Field of Sports Economics

16.2.1 "Profit Maximization" vs. "Win Maximization" or: How I Learned to Stop Worrying and Love Them Both

A threshold consideration essential to understanding the competitive and cooperative entanglements of NFL teams and their interplay with antitrust laws is to ask, at the end of the day, what is the ultimate goal of an NFL franchise? Many would argue (and have) that an NFL franchise is a business whose product happens to be the staging of professional football exhibitions and therefore, like most businesses, its ultimate goal is to make a profit that inures to the benefit of the owners of the business.[4] The idea, then, that NFL franchises are "profit maximizers" is an intuitive

[4] *See*, e.g., Hamlen WA Jr (2007) Deviations from equity and parity in the national football league. J Sports Econ 8:596–615, 596 ("Thus, it is recognized that although the profit motive is only one of the possible motives that could be assumed, it does represent the benchmark objective and the one that should be considered first."). *Id*. at 598.

and compelling argument to many. That said, unlike businesses in almost any other market, an NFL franchise has interested and passionate stakeholders (that is to say, *fans*) in its orbit whose interests lean less toward team profitability and more toward its competitiveness on the field. The most visible among these fans, we must not forget (with apologies of course to "St. Vince" of the Green Bay Packers, "Fireman Ed" of the New York Jets, and the entire populations of the "Dawg Pound" in Cleveland and "Black Hole" in Oakland), are the *owners* themselves. Therefore, others would argue (and have) that the interests of NFL owners extend well beyond profits to the maximization of what is generally considered "utility" in this area: *wins*.[5]

So, which is it? What follows is a general introduction to each model and a general application of the principles in the case of the NFL.

16.2.2 Profit Maximization

As the name suggests, the profit-maximization hypothesis proposes that franchise owners, in making their decisions regarding players to employ and the stadia and media channels to use, such owners are ultimately trying to maximize their team's total profit. The profit-maximization model posits that a given owner's objective is to maximize the franchise's profits (π) given a particular level of talent (t), and which profit-maximizing club will go out into the market and acquire inputs until the marginal revenue product of the talent acquired equals the marginal cost thereof (c).[6] A franchise's profitability is equal to its total revenues (R_t) minus its total costs (c_t), where revenues are generally discussed as a function of the team's market size (m) and winning percentage (w) (which is itself a function of the relative talent level of the team (t_1) vis-à-vis the aggregate talent in the league (t_2)), yielding a profitability function for an individual franchise in a simple two-team league as follows[7]:

$$\pi_1 = R_1[m_1, w_1(t_1, t_2)] - c_t. \qquad (16.1)$$

[5] *See,* e.g., Neale WC (1964) The peculiar economics of professional sports. Q J Econ 78:1–14; Cairns J, Jennett N, Sloane PJ (1986) The economics of professional sports leagues: some insights on the reform of transfer markets. J Econ Stud 13:87–107; and Dr. Kesenne S (2006) Club objectives and ticket pricing in professional team sports. Eastern Econ J 32:549 ("[m]aximizing the winning percentage of a team, as a special case of utility maximization, is a rather specific but not unrealistic objective" of many sports teams).

[6] *See* Vrooman J (2009) Theory of the perfect game: competitive balance in monopoly sports leagues. Rev Ind Org 34:5–44.

[7] *Id*. at 7.

Models of profit maximization generally assume that the primary (if not the only) significant source of revenue is from gate receipts, to preclude the introduction of any distortion from shared revenue streams, and that all of the teams in a given league face the same marginal cost of playing talent as they draw from the same pool of labor.[8] Purely profit-maximizing team owners, constrained by their marginal revenue curve and their narrower conception of utility (here, *income*) will, *ceteris paribus*, have a lower demand for player talent at a given price than such owner's win-maximizing counterpart.[9] Moreover, as between different profit-maximizing teams facing differing marginal revenue curves, the demand for players will be different. To see why this is, we need to consider the various choices faced by owners in the long and short run and accept the premise that, week-to-week results or seasonal anomalies in the NFL notwithstanding, *winning is a choice*.

In the short run, all of the inputs to a team's production (i.e., stadia and, most importantly, playing talent) are fixed and, therefore, its likely winning percentage along with it. The owner is then tasked with making decisions about the team's output and prices in light of these fixed inputs and related "fixed" team quality. This is not to say that all of the input costs are completely fixed, even in the short run, as some input costs will be incurred whether a team plays a game or not (i.e., player costs, league participation costs, stadium lease payments) and others increase or decrease based on the level of output (i.e., marketing efforts, stadium guest services). Whether completely fixed or to a certain extent variable, these costs make up a team's total costs in the short run. In addition to these costs, team owners will be faced with a downward sloping demand curve (i.e., the quantity of output demanded by fans moves inversely to the price) from which the team's total and, more importantly, *marginal* revenue are derived, though the slope of such demand curve (i.e., fans' aggregate price elasticity) is influenced by many factors, including local market demographics and relative wealth, team history and tradition, and the fans' relative demand for quality.[10] Given the short-run cost function and market demand faced by the owner, such owner will choose the level of output that maximizes profit. Short-run behavior, as laid out above, likely feels to you more like an *eventuality*, given choices made by the owner in the past (i.e., on players and coaches employed) and circumstances over which owners do not have control in the short run (i.e., the demand for quality in their local markets and the demographics therein). The more interesting inquiry, therefore, is what an owner will choose to pursue in the *long* run.

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[8] *Id.*; *see also* Fort R, Quirk J (2004) Owner objectives and competitive balance. J Sports Econ 5:20–32.

[9] Fort & Quirk, *supra* note 8 at 25.

[10] Simon Rottenberg was the first to introduce the implications of this model in his examination of the labor market for baseball players. *See* Rottenberg, *supra* note 3. Rottenberg's "invariance proposition" is based on the assumption that teams are profit maximizers whose willingness to pay for the input of player talent is derivative of the demand for the team's output (games).

In the long run, all of a team's inputs in its production process are variable. Said differently, on a long enough timeline, an owner can change every player on the team's roster, every person employed on the coaching staff and in the front office, and even what stadium or *city* in which the team operates. In the long run, owners must make choices on the level of quality of the team they are going to put on the field, which in turn requires concordant investments in players, coaches, and front office personnel of a certain caliber, investments in player scouting and development, as well as stadium location, plant, and amenities. The long-run decision-making process is ultimately the same as the short-run process for profit-maximizing owners, namely, that the owner will choose the level of output which results in the highest level of profit at the corresponding level of team quality which the owner has chosen to field. The difference in the long run is that even the level of team quality is variable by the owner too.[11]

Looking over the potential quality choices, an owner will be confronted with certain realities which will influence their ultimate decision. First, is that total costs continue to rise as more inputs are purchased to implement in the production process but, more importantly, past a certain level of such inputs, their *marginal* cost begin to increase at an increasing rate. Next, assuming an owner has not made the decision to move their team (and no material demographic shifts have occurred), the local market in which the team operates will dictate the shape and pitch of the downward sloping demand and marginal revenue curves, indicating how fertile the market is for each marginal level of investment (i.e., the "bang for each investment buck") and reflecting fans' willingness to pay for different quality levels of the team.[12] Finally, and derivative of the first two points, the owner will face a concave and downward-facing

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[11] The foregoing analysis is useful to understand the decision-making process and its implements with respect to owners, though it should be acknowledged that it is a fairly simplistic and, in some respects, unrealistic way of looking at the functioning of teams. As many economists would note, the decisions of owners with respect to player talent, coaching talent, and even venues are not made individually or in a vacuum, but are made within the context of a market for such inputs where any one team's decisions and the associated costs are to varying degrees dependent on the choices of other teams in the market. *See*, e.g., Kesenne S (2009) What's the game team owners play? Rivista di Diritto ed Economia Dello Sport 5:81–84; Szymanski (2004) Professional team sports are only a game: the Walrasian fixed-supply conjecture model, contest-Nash equilibrium and the invariance principle. J Sports Econ 5:111. That said, the realities of these markets do not change the analysis which instructs owners' ultimate goals, only the degree to which they may actually achieve them.

[12] Previous work in this area suggests that the most talented players *do* have a higher marginal revenue product of labor with respect to large market teams than for small market teams. *See,* e.g., Scully GW (1974) Pay and performance in major league baseball. Am Econ Rev 64:915–930. Ultimately, this is likely to lead to significant talent discrepancies between large (or otherwise "good") market and small (or otherwise "poor") market teams, which may intuitively be expected to have a deleterious effect on fan interest as the contests between the teams become more and more predictable. *See* Quirk J, Fort R (1997) Competitive balance in sports leagues. Princeton University Press, Princeton, pp 240–293; *see also* Crooker JR, Fenn AJ (2007) Sports leagues and parity when league parity generates fan enthusiasm. J Sports Econ 8:139, 157.

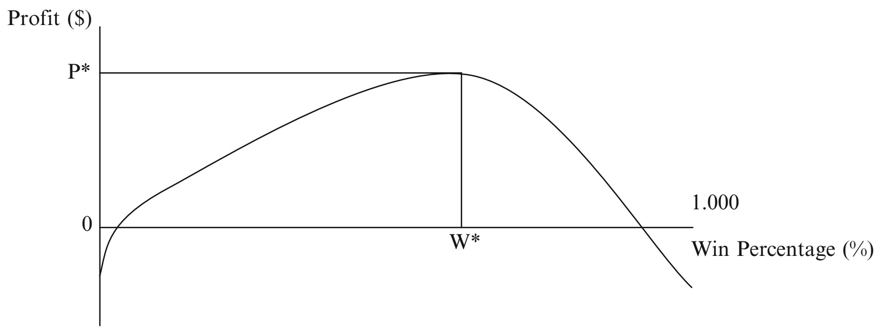

Fig. 16.1 Profit vs. win percentage

profits function which reflects the reality that as costs for players, coaches, and other inputs are incurred and the team quality and revenues increase accordingly, eventually the marginal costs of the successively higher levels of quality begin to increase at an increasing rate and overtake the marginal revenue achieved from such levels of team success, which reduces overall profitability thereafter until it becomes zero and then a loss. A graphical illustration of this function can be viewed in Fig. 16.1 above.

The owner, therefore, will choose the long-run level of team quality where, based on the team's particular revenue and cost functions, marginal revenue derived from the last production input equals the marginal cost thereof and profit is maximized. Viewed differently, at the output level (the chosen team quality) immediately prior to the profit-maximizing level, the explanation above suggests that the marginal revenue derived from the input at such level still exceeds the marginal cost thereof and so there is still profit to be made by purchasing and implementing that next input. At the output level immediately beyond the profit-maximizing level, the marginal revenue derived from the input at such level is less than its marginal cost and so the owner's profit will decrease by its purchase and implementation.

While the foregoing discussion might make some intuitive sense and seems to follow basic microeconomic principles with which many readers will be familiar, some might still be uncomfortable with the idea that a profit-maximizing approach explains all of the decisions an owner makes.

16.2.3 Win Maximization

The win-maximizing hypothesis argues that team owners take into consideration more than just the book profitability of their respective teams in making decisions regarding their operation, and the owner's ultimate goal is to field the most competitive team possible in order to maximize wins and championships within the budget constraints of the owner. Assuming for our purposes that a win-maximizing owner faces the same short- and long-run cost, revenue, and profitability functions faced by the profit-maximizing owner discussed above (a reasonable assumption in that none of those functions themselves were dependent on the owner's position as a profit maximizer), what does this mean for the behavior of a win-maximizing owner?

If wins and not profits had primacy in the owner's mind, we would expect such an owner to be willing to continue to spend money on better players and better coaches and better venues *not* until the marginal revenue of such inputs equaled the marginal cost thereof, but well past that point until the owner had no available profit left to spend, where *total* revenue equaled *total* cost (we are assuming that the owner would not spend the team into deficit). Thinking back to the downward-facing, concave profitability function depicted in Figure 16.1 above, the profit-maximizing owner would thus choose a level of output where the arc of profitability was at its highest point (W*, P*), while the win-maximizing owner would acquire inputs until the arc descended to the *x*-axis and was zero. The implications of this suggest that win-maximizing teams' demand curves for playing, coaching, and front office talent, as well as for other inputs in production, would be shifted to the right of (that is, greater than) the demand for such inputs by its profit-maximizing counterparts, as shown in an economic model constructed by scholars Rodney Fort and James Quirk in 2004.[13] This also would mean, given a relatively fixed supply of labor, as we see in the NFL and other major North American sports leagues, that the equilibrium prices for such inputs in a league with win maximizing owners will be comparatively greater than the equilibrium prices in leagues with profit-maximizing owners as win maximizers bid up prices in search of ever more costly wins.[14]

Extrapolating this analysis, some examiners of the win-maximizing hypothesis argue that this approach will ultimately be bad for business, the NFL's self-professed desire for win-maximizing behavior and competitive parity notwithstanding. Peter Sloane argued as early as 1971 that under win-maximization, the diminishing returns following from investments in team quality past the point at which the marginal revenue exceeds the marginal cost (that is, the point at which a profit-maximizing owner would theoretically stop) will not create much of a restraint on team behavior, as teams with already high winning percentages will sacrifice marginal profits to become even better.[15] Sloane's analysis suggests that leagues which contain purely or predominantly win-maximizing teams will eventually find themselves in a so-called "death spiral" where good teams will acquire the best talent, past the point at which profit maximization would suggest and without regard to marginal profitability, and poorer teams in poorer markets will be left without sufficient talent to be competitive.[16] The result,

[13] *See* Fort and Quirk, *supra* note 8.

[14] *Id.*

[15] *See* Sloane PJ (1971) The economics of professional football: the football club is a utility maximiser. Scott J Polit Econ 18:121–146.

[16] *Id.*

according to Sloane and others, is that a widening chasm develops between the best and worst teams, destroying the competitiveness of games within the league and fan interest along with it.

With a general understanding of the two primary optimization functions in hand, the question becomes which of the two models better describe the behavior of owners in the NFL?

16.3 Application to the NFL

While every owner is likely to say that their goal is to win and to put the best team out on the field, it is clear that win maximization does not completely describe the actions taken by owners. As we will see below, few teams in the NFL lose money from year to year and the exponential growth in franchise values does not suggest a situation in which franchises compete away all of their profits. Moreover, examiners of the win-maximizing hypothesis suggest a likely outcome for a league dominated by win-maximizing teams will be the eventual destruction of competitive balance and inviability of poorer market teams, an outcome which has not manifest in the NFL where competitive parity has reigned supreme. The answer as to whether the profit-maximizing or win-maximizing model describes the NFL is somewhat inconclusive, though the author would suggest that, on the spectrum of possibilities, NFL owners are more profit-conscious than win-conscious.

Win, lose, or (the very occasional) draw, the NFL has been a marvelously successful enterprise for the league and its teams, especially in recent years under the last several labor agreements with players and broadcasting agreements with the various networks. As depicted in Tables 16.1 and 16.2 below, between the 1999 and 2009 seasons, NFL teams saw their average revenues increase approximately 8.4% *per year* (and no team increased by less than an average of 5% year over year) during a decade which included two significant economic recessions in the United States and witnessed the proliferation of a vast array of entertainment products and outlets that one might expect to chip away at the attention span of NFL fans.[17] Moreover, during that timeframe, there were only two instances in which *any* NFL team saw its revenue decline from the preceding year, one of which understandably being the 2005 New Orleans Saints who were displaced for the entire season following the ravages of Hurricane Katrina. The other instance was the 5-win 2005 Detroit Lions, who saw their revenues decline to \$178 million from \$186 million in 2004 and who nevertheless bounced back to a then-team record \$189 million in revenues in 2006 despite losing an additional two games.

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[17] The revenue data per team is set forth in an annual survey of team values and financial information conducted by Forbes Magazine. For the most recent iteration of Forbes' invaluable list, *see* Badenhausen K, Ozanian MK, Settimi C (2010) The business of football, 2010. Forbes. Available at http://www.forbes.com/2010/08/25/most-valuable-nfl-teams-business-sports-football-valuations-10_land.html (last visited October 2, 2010).

Table 16.1 NFL team win percentages

Team	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Arizona Cardinals	0.375	0.187	0.438	0.312	0.250	0.375	0.313	0.312	0.500	0.563	0.625
Atlanta Falcons	0.312	0.250	0.438	0.594	0.312	0.688	0.500	0.438	0.250	0.688	0.563
Baltimore Ravens	0.500	0.750	0.625	0.438	0.625	0.562	0.375	0.812	0.313	0.688	0.563
Buffalo Bills	0.687	0.500	0.188	0.500	0.375	0.562	0.313	0.438	0.438	0.438	0.375
Carolina Panthers	0.500	0.437	0.062	0.438	0.688	0.438	0.688	0.500	0.438	0.750	0.500
Chicago Bears	0.375	0.312	0.812	0.250	0.438	0.312	0.688	0.812	0.438	0.563	0.438
Cincinnati Bengals	0.250	0.250	0.375	0.125	0.500	0.500	0.688	0.500	0.438	0.281	0.625
Cleveland Browns	0.125	0.187	0.438	0.562	0.312	0.250	0.375	0.250	0.625	0.250	0.313
Dallas Cowboys	0.500	0.312	0.312	0.312	0.625	0.375	0.563	0.562	0.813	0.563	0.688
Denver Broncos	0.375	0.687	0.500	0.562	0.625	0.625	0.813	0.562	0.438	0.500	0.500
Detroit Lions	0.500	0.562	0.125	0.188	0.312	0.375	0.313	0.188	0.438	0.000	0.125
Green Bay Packers	0.500	0.562	0.750	0.750	0.625	0.625	0.250	0.500	0.813	0.375	0.688
Houston Texans	*	*	*	0.250	0.312	0.438	0.125	0.375	0.500	0.500	0.563
Indianapolis Colts	0.812	0.625	0.375	0.625	0.750	0.750	0.875	0.750	0.813	0.750	0.875
Jacksonville Jaguars	0.875	0.437	0.375	0.375	0.312	0.562	0.750	0.500	0.688	0.313	0.438
Kansas City Chiefs	0.562	0.437	0.375	0.500	0.812	0.438	0.625	0.562	0.250	0.125	0.250
Miami Dolphins	0.562	0.687	0.688	0.562	0.625	0.250	0.563	0.375	0.063	0.688	0.438
Minnesota Vikings	0.625	0.687	0.312	0.375	0.562	0.500	0.563	0.375	0.500	0.625	0.750
New England Patriots	0.500	0.312	0.688	0.562	0.875	0.875	0.625	0.750	1.000	0.688	0.625
New Orleans Saints	0.187	0.625	0.438	0.562	0.500	0.500	0.188	0.625	0.438	0.500	0.813
New York Giants	0.437	0.750	0.438	0.625	0.250	0.375	0.688	0.500	0.625	0.750	0.500
New York Jets	0.500	0.562	0.625	0.562	0.375	0.625	0.250	0.625	0.250	0.563	0.563
Oakland Raiders	0.500	0.750	0.625	0.688	0.250	0.312	0.250	0.125	0.250	0.313	0.313
Philadelphia Eagles	0.312	0.687	0.688	0.750	0.750	0.812	0.375	0.625	0.500	0.594	0.688
Pittsburgh Steelers	0.375	0.562	0.812	0.656	0.375	0.938	0.688	0.500	0.625	0.750	0.563
San Diego Chargers	0.500	0.062	0.312	0.500	0.250	0.750	0.563	0.875	0.688	0.500	0.813
San Francisco 49ers	0.250	0.375	0.750	0.625	0.438	0.125	0.250	0.438	0.313	0.438	0.500
Seattle Seahawks	0.562	0.375	0.562	0.438	0.625	0.562	0.813	0.562	0.625	0.250	0.313
St. Louis Rams	0.812	0.625	0.875	0.438	0.750	0.500	0.375	0.500	0.188	0.125	0.063
Tampa Bay Buccaneers	0.687	0.625	0.562	0.750	0.438	0.312	0.688	0.250	0.563	0.563	0.188
Tennessee Titans	0.812	0.812	0.438	0.688	0.750	0.312	0.250	0.500	0.625	0.813	0.500
Washington Redskins	0.625	0.500	0.500	0.438	0.312	0.375	0.625	0.312	0.563	0.500	0.250
Median Win %	0.500	0.562	0.438	0.531	0.469	0.500	0.563	0.500	0.500	0.532	0.500

* The Houston Texans did not begin play until the 2002–2003 season

Table 16.2 NFL team revenues ($millions)

Team	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Corr. (%)	Rev. growth (%)
Arizona Cardinals	102	107	110	126	131	153	158	189	203	223	236	73.6	8.9
Atlanta Falcons	107	113	120	133	144	168	170	185	203	214	231	42.7	8.1
Baltimore Ravens	123	139	148	155	172	192	201	205	226	240	255	−8.4	7.6
Buffalo Bills	114	123	131	141	152	173	176	189	206	222	228	−22.7	7.2
Carolina Panthers	128	144	152	161	169	195	199	203	221	238	247	39.6	6.9
Chicago Bears	103	113	124	132	175	193	201	209	226	241	254	22.6	9.7
Cincinnati Bengals	92	120	130	141	150	171	175	194	205	222	232	51.8	9.9
Cleveland Browns	146	153	158	174	183	203	206	206	220	235	242	19.5	5.2
Dallas Cowboys	174	181	189	198	205	231	235	242	269	280	420	60.7	9.9
Denver Broncos	107	115	159	171	183	202	207	212	226	240	250	2.4	9.3
Detroit Lions	100	109	116	159	168	186	*178*	189	204	208	210	−48.7	8.2
Green Bay Packers	109	119	132	152	168	189	194	197	218	232	242	−9.3	8.4
Houston Texans	*	*	*	193	201	215	222	225	239	256	272	72.1	5.0
Indianapolis Colts	107	118	127	137	145	166	167	184	203	233	248	50.5	8.8
Jacksonville Jaguars	121	132	137	142	153	169	173	189	204	217	220	−15.0	6.2
Kansas City Chiefs	115	125	138	150	159	181	186	196	214	228	235	−53.8	7.5
Miami Dolphins	131	141	145	159	170	190	194	215	232	242	247	−48.2	6.6
Minnesota Vikings	104	112	123	135	144	164	167	182	195	209	221	22.6	7.9
New England Patriots	113	128	136	189	191	236	250	255	282	302	318	50.4	11.4
New Orleans Saints	105	116	139	146	157	175	*160*	194	213	232	245	49.2	9.1
New York Giants	111	120	134	143	154	175	182	195	214	230	241	21.1	8.1
New York Jets	110	121	131	142	152	172	179	193	213	227	238	−15.2	8.1
Oakland Raiders	105	117	132	144	149	169	171	189	205	215	217	−70.0	7.6
Philadelphia Eagles	106	116	120	134	198	216	218	224	237	250	260	6.2	10.0
Pittsburgh Steelers	96	109	142	152	159	182	187	198	216	235	243	29.2	10.0
San Diego Chargers	109	119	131	140	148	165	170	192	207	224	233	66.2	7.9
San Francisco 49ers	112	120	129	142	151	171	171	186	201	214	226	−9.1	7.3
Seattle Seahawks	102	110	119	153	158	183	189	196	215	231	241	−19.8	9.2
St. Louis Rams	116	124	136	150	157	176	179	193	206	217	223	−88.6	6.8
Tampa Bay Buccaneers	133	146	151	168	175	195	203	205	224	241	246	−51.7	6.4
Tennessee Titans	126	134	141	155	164	186	189	196	216	232	242	−25.0	6.8
Washington Redskins	176	194	204	227	245	287	303	312	327	345	353	−33.5	7.3
Median	$3,603	$3,938	$4,284	$4,944	$5,330	$6,029	$6,160	$6,539	$7,090	$7,575	$8,016	8.7	8.4

Source: Forbes

* The Houston Texans did not begin play until the 2002–2003 season

The example of the 2004–2006 Detroit Lions above provides a useful segue into a core reality of the current NFL: a team's financial success does not seem to bear any significant relationship to its competitive success on the field. Examining Table 16.2 a bit further, the column titled "Corr." displays a simple correlation between each team's revenues in the decade from 1999 through 2009 and its respective winning percentage during those years. As you can see, the correlations vary wildly, from the Arizona Cardinals (whose revenues bear a positive correlation of more than 73% to its winning percentage) to the St. Louis Rams (whose revenues move in nearly a perfectly *inverse* fashion to its performance, which makes little intuitive sense). Overall, on the spectrum of correlation, with negative 100% representing a perfect inverse relationship between the movements of revenues and winning percentage and positive 100% representing a perfectly positively synchronous relationship between their movements, the overall correlation for the NFL in the last decade is approximately 8.65%, indicating that their movements are, remarkably, nearly independent of one another. The potential reason for this may as alluded to above: NFL teams have experienced sustained increases in revenues year over year whether they win games or not.[18]

This revelation bears significant relevance to the discussion regarding the ultimate goals of NFL owners, and helps explain why a definitive answer regarding profit- or win-maximizing intent is not apparent. With seemingly little relationship between a team's winning percentage and its ability to achieve sustainably increased revenue, we might expect owners to cut back significantly on investments in players, coaching talent, front office acumen and player scouting, and training and development in the hopes of amplifying profits. However, this does not appear to describe many, if any, owners in the NFL where significant sums are spent in these endeavors. On the other hand, as discussed above, NFL owners do not appear to be competing away profits in pursuit of marginal wins, indicating that profitability is still a very relevant consideration.

A few words of caution on the analysis above are in order. We do not discuss here the effects of the NFL's generous (as compared to other major sports) revenue-sharing arrangements, which contribute significant sums to each team's revenue performance each year and bear no relation to the on-field performance of the teams receiving the money. Whatever ameliorative effects this might have on the incentive to field a winning team, there are certainly competitive balance and other countervailing considerations which may justify the NFL's system Additionally, we discuss above the absolute changes from year to year of a team's overall revenue vis-à-vis its winning percentage, which presents a few measurement issues. First, a team's performance in a particular year may not translate to increased or decreased revenues solely (or even predominantly) within that same year. It is entirely possible that a great or terrible season by a team might have revenue repercussions which manifest predominantly in succeeding seasons. Next, the revenues discussed here are not adjusted for inflation, which we might expect to have an effect over a period

[18] The author that the discussion herein contemplates the results of a simple correlation analysis, which is needfull here to illustrate the relative movements of team revenues and winning percentages. This should not be confused with *causation*, which can only be described at a level of confidence and statistical siginificance using a robust regression analysis that was not employed here.

of 10 years. Last, the revenue levels actually achieved by a team do not necessarily tell us anything about the financial performance which *might have been achieved* had the owner made the decision to put a better product on the field. That is to say, while the correlations depict a remarkable independence between winning percentage and revenues, they do not necessarily tell us how much money the owner left on the table (or gave away unnecessarily) from a marginal perspective due to the team quality decisions they made. Nevertheless, the apparent independence of competitive results from financial ones in the NFL may have significant repercussions on the ultimate decision-making process of owners for their teams.

Armed with a general understanding of the ultimate ends which NFL owners pursue, we next turn to a discussion of how the teams organize themselves within a league to accomplish them, as well as the inputs and outputs involved therein.

16.4 The Industrial Organization of the NFL

Given the nature of professional team sports like the NFL and from what we have discussed to this point, it should be clear that NFL teams do not operate in what we would classically describe as a competitive market. Rather, there are significant legal, economic, and practical barriers to potential new entrants into the league. Further, the outputs produced by the teams are not what any fan would consider readily interchangeable, each of which certainly put that notion to rest. Instead, we see that while the teams compete with one another in the most visible sense on the field, they certainly undertake a number of cooperative efforts off of the field and have organized themselves into a league as a vehicle for the delivery of their product to the market. The question really becomes whether the NFL's organization is properly categorized as a "single entity" or as a "cartel?"

"Cartel" is a particularly loaded term in our modern parlance, conjuring up images of gunfights on the streets of Medellín and Middle Eastern oil ministers more readily than thoughts of anything related to sports. In economic terms, a cartel refers to a formal or informal arrangement among would-be competitors in a market to control the supply, production, price, marketing, or other aspects of the relevant market. On the other hand, a single entity, as the name implies, refers to a single, discreet economic actor or source of economic power. The answer as to which term more readily applies to the NFL can depend on the context in which the question is asked and the relevant economic market in question. Most, though certainly not all,[19] economic and legal scholars tend to think of the NFL as a cartel, consisting of competitive teams who have agreed to cooperate in certain aspects within the construct of the league. To understand the reasons for this conclusion, we will next consider the question in the context of the inputs employed by the league and its various outputs.

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[19] Gary Roberts, in an influential piece in the *UCLA Law Review*, lays out the argument, if not the defense, for the prospect that professional sports leagues are single entities. *See*, Roberts (1984) Sports leagues and the Sherman Act. UCLA Law Rev 32:219–301.

16.4.1 Inputs and Outputs

While the NFL is certainly qualitatively different from your average manufacturing operation, and therefore does not lend itself as readily to an intuitive cost-of-goods-sold analysis, the NFL nevertheless employs numerous inputs in its version of the production process. Most visible among these is the employment of talented athletes, which teams acquire through the NFL entry draft, free agency, and other methods, described in greater detail in Chaps. 11 and 12 of this text. Whatever the acquisition method for players, however, it is important to note that each such acquisition is made through a channel sanctioned by the NFL and agreed to by each of the other constituent teams. A related but separate input is the employment of talented coaches and front office personnel who are charged with the day-to-day operation of the team, scouting and developing players, managing the team's relationships with other teams, the league, and the public, and otherwise generally managing the team's business. A team with players and people to train them will obviously need a place to play games and hold practices, so teams build or lease stadium venues in which to host their exhibitions. In order to get people to come out to the stadium or tune into to a broadcast of a game, a team will deploy personnel and resources to advertise the event and ensure it receives the desired media coverage. This general discussion is by no means an exhaustive treatment of the various inputs used by an NFL team but should nevertheless serve as a primer to be recalled in the context of teams' competition and cooperation in the markets for them.

On the other side of the ledger, we can consider the NFL and its teams as participants in certain distinct but related output markets.[20] The most readily apparent output flowing from teams' efforts is live exhibitions of professional football. For fans who tune in rather than come out to the stadium, they are consumers in a market derivative from exhibitions: the output market for broadcast exhibitions of professional football. As we will discuss in Sect. 16.5.1 in the context of *The Sports Broadcasting Act*, today NFL teams and the league itself enter into collective arrangements with broadcast networks for the right to air NFL games and disseminate accounts of the action.

To meet the desires of fans to outwardly display their allegiance to the team, NFL teams participate in the output market for team- and league-related merchandise and other intellectual property. As we discuss in Sect. 16.5.5 with respect to the *American Needle* case, in the early 1960s following years of individual competition, NFL teams began to collectively promote the NFL brand through the formation of National Football League Properties, a separate corporate entity tasked with (1) developing, licensing, and marketing the intellectual property owned by the NFL teams and (2) conducting advertising campaigns on behalf of the NFL and its constituent teams.[21]

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[20] A very useful discussion of the various output markets with respect to professional teams and leagues can be found in Kesenne (2007) The economic theory of professional team sports: an analytical treatment, pp 8–25.

[21] American Needle, Inc. v. National Football League, 538F.3d 736, 737 (7th Cir. 2008).

Taking a step back, a more meta view of the NFL and its operations finds that even the production of NFL franchises themselves are relevant outputs.

The various competitive and cooperative entanglements of the NFL and its teams are dynamic and, depending on the relevant input or output market, the nature of the relationships changes. We will next examine the relationship between the NFL and its teams, as well as the relationship between the teams themselves, using the recent history of professional soccer in the United States as a foil to aid our understanding of the NFL's structure.

16.4.2 The NFL as Maestro and Detached Arbiter: The Relationship Between NFL Teams and the League

The NFL itself is an unincorporated, nonprofit association[22] organized by and for the benefit of its 32 member teams, each of which is a separate, independently owned, and controlled for-profit entity. Indeed, Section 3.2(A) of the NFL's Constitution and Bylaws specifies that "[n]o corporation, association, partnership, or other entity not operated for profit" is eligible for membership in the league, and Section 9.1 makes clear that no owner or other stakeholder in an NFL franchise may "[o]wn or have any financial interest, directly or indirectly, in any other member club of the League."[23] The NFL's governing documents therefore make clear that there will be bright-line distinctions between the organization of each of the clubs and the NFL's role, stated in the first substantive provisions of its Constitution and Bylaws, is rather to "promote and foster the primary business of League members."[24] In addition, the NFL is headed by a Commissioner who is elected and retained by, whose compensation is determined by, and who serves at the pleasure of, the NFL teams (that is to say, their owners).[25]

The NFL also has a role to play in promoting the collective fortunes of its constituent teams, through the promotion of cooperation and competition among the teams and maintaining policies to ensure contest legitimacy in the eyes of fans. The NFL acts as a central clearinghouse at the behest of its member teams, through which the teams establish rules and standards of conduct, and construct the architecture of their competitive relationship in order to promote their interests while avoiding the administrative and logistical hassle of requiring teams to all agree on each issue individually with each other team. To be sure, this organizational structure impinges on the competitive interests and freedoms of individual teams (or groups of them) from time to time, as we will see below in the context of the *Los Angeles Raiders* cases, though it is thought by the member teams that such a unitary organization is more

[22] NFL Constitution and Bylaws, Section 2.2.

[23] NFL Constitution and Bylaws, Sections 3.2(A) and 9.1(B)(1).

[24] NFL Constitution and Bylaws, Section 2.1(A).

[25] NFL Constitution and Bylaws, Section 8.1.

efficient and effective for all teams on the whole. In addition to fostering necessary cooperation between the teams, an important part of the NFL's core function is to establish mechanisms through which teams deliver exciting on-field competition in which the outcome of both the game and season is in doubt, without which fan interest cannot be expected to be maintained and the finances of all teams suffer.

The NFL accomplishes this task in a variety of ways: for example, (1) establishing player allocation methods like the entry draft in which teams with the worst records from the preceding season are given the first picks with respect to eligible collegiate players, (2) employing "unbalanced" schedules in which weaker teams from the preceding seasons are scheduled more games against teams of similar strength and teams do not all play the same teams (making comparison of records less easy), each of which serves to make the outcome of games week to week more in doubt, (3) installation of salary caps and minimum salary levels to assist the profitability of all teams and prevent richer clubs in more fertile economic markets from siphoning off the best talent, (4) revenue-sharing under which approximately 70% of all league revenues are divided equally among the teams (though query whether such a generous sharing system reduces the incentive to invest in winning, on the margin),[26] and (5) setting forth ownership rules such as that in Section 9.1 of its Constitution and Bylaws discussed above to avoid the insinuation of fixed outcomes that common ownership might invite. These concepts will be discussed in greater detail in Chaps. 9, 11 and 12 of this text.

While organizing themselves in a league and participating in significant cooperative efforts as discussed above, NFL teams themselves nevertheless compete with one another in a whole host of ways, for inputs like player talent, coaching and front office acumen, stadium venues, media coverage, sponsorships and the like. In these areas, the interests of teams diverge and they engage in vigorous competition against one another to secure the best talent, most profitable business arrangements, and best venues and channels through which to promote their respective teams. On the other hand, much of the output produced by NFL teams is the product of necessarily *collective* effort. For instance, no one team can produce an NFL game, games would not be particularly enjoyable if there was not a uniform set of rules governing them, the league itself would be less interesting if it were left to teams themselves to schedule games in an ad-hoc fashion rather than pursuant to an agreed-upon schedule, and fan interest may be damaged in the long run if there were no player allocation and salary cap mechanisms in place to help maintain competitive balance. Moreover, as we will discuss later on, NFL teams license certain intellectual property rights as a collective unit, the league licenses its over-the-air broadcast rights collectively and NFL can be fairly described as a competitor unto itself in the broader market for entertainment products both in the United States and around the world.

[26] *See* Zimbalist AS (2002) Competitive balance in sports leagues: an introduction. J Sports Econ 3:111, 117–118 (finding that "[e]conometric work has made it clear that there is little, if any, profit incentive to win in the NFL.").

It is precisely this ambiguity between a loose collective of self-interested franchises and a singular economic actor which presents a problem of economic and legal definition. As will become clearer in the context of our discussion of antitrust law in Sect. 16.4 below, this issue of definition is not simply academic but presents courts and interested parties with real dilemmas in the application of antitrust statutes and caselaw which seek to prohibit agreements between would-be competitors in restraint of trade in a defined market. Moreover, whether or not the NFL can be said to be a single entity or not is a threshold issue in deciding whether NFL teams are even *capable* of violating significant portions of our antitrust laws through their cooperation, and so the organizational structure of the league, the interactions of its teams, and the nature of their relationships remains a heavily scrutinized issue.

Keeping in mind our previous discussion of the industrial organization of the NFL, it may be useful here to take a moment to juxtapose the structure of the NFL and the relationships among it and its teams to that of Major League Soccer in the United States (the "MLS"), a more recent iteration of the American professional sports league explicitly formed as a single entity. The MLS was formed in 1995 as a single limited liability company in the state of Delaware, as compared to the NFL which is a consortium of separately founded legal entities of various types. The MLS is owned by a number of independent investors (composed of a mix of corporations, partnerships, and individuals), who own shares in the league and sit on a management committee called the "Board of Governors." Despite the varied ownership in the MLS itself, the league has retained substantial centralized control over the teams and league operations. In fact, the MLS owns directly all of the teams that play in the league, as well as all intellectual property rights, tickets, supplied equipment, and broadcast rights. The MLS sets all team schedules, negotiates stadium leases (and assumes related liabilities), and supplies certain equipment. The MLS' central league offices run each of the teams, sign and allocate players, coaches, general managers, and staff, and set and collect prices for tickets, concessions, local broadcasts, and merchandising ventures. Any revenues derived from operations are used to pay any of the costs incurred by the teams and any net profits are to be paid out as dividends to the investor-shareholders.

The MLS' control over its players is equally as complete. The MLS itself is responsible for negotiating, entering into, and carrying out all contracts with players in the league, not the teams individually. Indeed, the first line of the "Standard Player Agreement" which each MLS player signs states that "[t]his Agreement is made… by and between Major League Soccer, L.L.C., a Delaware limited liability company" and "the Player" named therein.[27] Despite going to these incredible lengths, when challenged under modern antitrust jurisprudence, the Court of Appeals for the First Circuit (seated in Boston, Massachusetts) in its analysis nevertheless called into serious question whether the MLS should be considered a single entity for antitrust purposes, though it ultimately decided the case without a definitive ruling on

[27] Major League Soccer, *Standard Player Agreement*, at 1 (on file with the author) [hereinafter *Standard Player Agreement*].

the issue.[28] The preceding discussion and comparison to the MLS was provided to serve as a comparison in considering the appropriate treatment of the NFL as we discuss the current landscape of our antitrust laws.

16.5 Introduction to Antitrust Law and Policy and Its Interaction with Professional Sports

We are consistently reminded by athletes, coaches, owners, and commentators of professional sport that they are, at base, a *business*. Our laws and policies with respect to competition seem to agree that professional sports like the NFL are indeed a business, though their treatment at the hands of such laws and in our courts can often be very different than what we would see applied to business competitors generally. The following is a primer on the relevant antitrust laws and cases which guide much of our analysis of the economic competition and cooperation at play in the NFL.

16.5.1 The Sherman Act

It has been said that nature is bloody "in tooth and claw"[29] and, to a large extent, that is the type of vigor we expect from competitors in economic markets as well. The Sherman Antitrust Act of 1890[30] (as amended, the "Sherman Act") was passed to protect competition in our free market economy from the collusive behavior of would-be competitors and the unlawful exercise of "market power"[31] by actors in a market (either in concert or solely by a dominant firm) in the belief that the mechanism of competition was the best and most efficient way to allocate scarce resources and maximize consumer welfare.[32] The argument with which we are so familiar is

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[28] *See* Fraser v. Major League Soccer, LLC, 284F.3d 47, 54 (1st Cir. 2002) (noting that the investor-operators hire coaches, general managers, and local staff at their own expense and in their sole discretion and that agreements involving home ticket prices, local marketing campaigns, and local broadcast licensing rights may be entered into by each of the investor-operators without prior approval of or notification to the MLS, each of which suggested to the court a significant amount of independence and economic autonomy).

[29] Alfred, Lord Tennyson, *In Memoriam A.H.H.*, verse XVI, *in* In Memoriam (1850) ("And love Creation's final law—Tho' Nature, red in tooth and claw ….").

[30] 15 U.S.C. §§ 1–7 (2004) (1890).

[31] "Market power" is itself a somewhat ambiguous phrase. In the context of this chapter, the author takes the term to mean either sole or concerted action by firms in a particular market which reduces output or restricts competition in order to raise prices.

[32] *See* Standard Oil v. Fed. Trace Comm'n, 340 U.S. 231, 248 (1951) ("The heart of our national economic policy long has been faith in the value of competition."). *See also* Nat'l Soc'y Prof. Engineers v. United States, 435 U.S. 679, 695 (1978) ("The Sherman Act reflects a legislative judgment that ultimately competition will produce not only lower prices, but also better goods and services … all elements of a bargain-quality, service, safety, and durability-and not just the immediate cost, are favorably affected by the free opportunity to select among alternative offers.").

that many firms competing in a market will increase consumer choice and their fierce competition for customers will foster innovation; price will be driven down to the marginal cost of production and those who can produce most efficiently will be rewarded. Though the true reasons for the Sherman Act's passage have been debated for decades,[33] the precise motives for Senator Sherman's authorship of the bill pale in importance here to the effect of its application to the business of professional sports.

Section 1 of the Sherman Act states in relevant part that "[e]very contract, combination … or conspiracy, in restraint of trade or commerce among the several States … is declared to be illegal." Elegant in its brevity, this section nevertheless achieves significant breadth in application—it addresses any concerted action, regardless of the relative market power of any or all of the parties, which acts to restrain trade in a relevant market. The limitation of Section 1's reach, however, is built into its text: "combination … or conspiracy." In order to fall under the purview of this section, the statute demands multiplicity of action, as well as some showing of restraint or anticompetitive effect.[34] By its very definition, then, "[r]estraints of trade created by a single actor or a single firm are immune from its coverage."[35] This looms large in the area of major professional sports as, in all of the four major professional sports in the United States, the leagues are organized as joint ventures (or really, *cartels*), bringing together would-be competitors in order to provide the product of sports entertainment. On its face, this would seem at the very least to permit application of Section 1, and in almost all instances regarding pro sports leagues, this has been held to be the case.[36] This deceptively expansive Section 1 web is often the reason why leagues proffer the "single-entity defense" discussed below.

Even a court's finding that a league was indeed a single entity would not be the panacea for the league's antitrust ills, as Section 2 of the Sherman Act applies to

[33] *See*, e.g., Bork R (1966) Legislative intent and the policy of the Sherman Act. J Law Econ 9:7, 12 ("Congress was very concerned that the law should not interfere with business efficiency. This concern, which was repeatedly stressed, was so strong that it led Congress to agree that monopoly itself was lawful if it was gained and maintained only through superior efficiency." This suggests a significant, if not the prevailing interest was in promoting market efficiency and competition); Robert Bork, *supra*, at 7 ("the policy the courts were intended to apply is the maximization of wealth or consumer want satisfaction."). *But see* Bradley R Jr (1990) On the origins of the Sherman Antitrust Act. Cato J 9:737–742 (arguing that personal animus for particular trust heads and his political defeat for the Republican nomination aided by the head of a diamond trust led Sherman on a "crusade" to break those who had spurned him).

[34] *See* Copperweld Corp. v. Independence Tube Corp., 467 U.S. 752, 768 (1984) (finding that a "plurality of actors" an implicit requirement for violation of Section 1 of the Sherman Act).

[35] *See* Jacobs MS (1991) Professional sports leagues, antitrust, and the single-entity theory: a defense of the status quo. Indiana Law J 67:25, 27.

[36] *See,* e.g., *Los Angeles Mem'l Coliseum Comm'n*, 726F.2d at 1388–1389 (rejecting the claim that the NFL is a single entity for Section 1 purposes and finding that the operation of the league is as a result of all the teams acting in a coordinated fashion). *But see American Needle*, 538F.3d at 737 (finding that, at least in the context of the licensing of intellectual property, the NFL teams constituted a single entity for antitrust purposes, though this decision was later reversed by the Supreme Court as discussed in Section 16.5.5 below. *See* American Needle, Inc. v. National Football League, No. 08-661 (U.S. May 24, 2010).

address allegations of unlawful monopolization, attempts to unlawfully monopolize a market, and conspiracies to do the same. Section 2 states in relevant part: "Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States … shall be deemed guilty of a felony …." [37] It is important to note, however, that Section 2 does not outlaw monopolies for the sake of *being* a monopoly, as attainment of such status and reaping the rewards which follow is often the carrot held out before the competitors in a market to encourage vigorous competition. The law reasons that monopoly pricing actually encourages entry and thus does not allow a firm to illegally maintain monopoly power.[38] Rather, Section 2 seeks to enjoin "anticompetitive conduct," meaning the "willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen,"[39] and so forth by those in possession of market power in a relevant market.[40] Relevant in the context of the NFL is that courts *have* generally found that the dominant league in a major sport does at least *possess* monopoly power,[41] though this has not been sufficient in any of the cases to subject the leagues to Section 2 discipline.

Also worth noting for its applications in the world of sports is the Clayton Antitrust Act of 1914[42] (as amended, the "Clayton Act"), which aimed to address gaps in the applicability of the Sherman Act and to proscribe certain types of conduct where such conduct would not be in the best interest of a competitive market. For instance, Section 2[43] of the Clayton Act addresses price discrimination between different purchasers of a product where such discrimination "substantially" lessens competition or tends to create a monopoly in any line of commerce. Section 3[44] tackles, among other

[37] 15 U.S.C. § 2 (2004) (1890).

[38] *See*, e.g., Berkey Photo, Inc. v. Eastman Kodak Co., 603F.2d 263, 294 (2d Cir. 1970) (the existence of monopoly power alone "is not in itself anticompetitive. Indeed, although a monopolist may be expected to charge a somewhat higher price than would prevail in a competitive market, there is probably no better way for it to guarantee that its dominance will be challenged than by greedily extracting the highest price it can.").

[39] United States v. Grinnell Corp., 384 U.S. 563, 570-71 (1966) ("The offense of monopoly under § 2 of the Sherman Act has two elements: (1) the possession of monopoly power in the relevant market and (2) the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident.").

[40] *See*, e.g., United States Football League v. National Football League, 842F.2d 1335, 1361 (2d Cir. 1988) (upholding jury verdict that a monopolist "is free to set as its legitimate goal the maximization of its own profits so long as it does not exercise its power to maintain that power.").

[41] *See*, e.g., *United States Football League*, 842F.2d at 1364; Philadelphia World Hockey Club, Inc. v. Philadelphia Hockey Club, Inc., 351F. Supp. 462 (E.D. Pa. 1972); Fishman v. Estate of Wirtz, 1981-2 Trade Cas. (CCH) ¶64,378 (N.D. Ill. Oct. 28, 1981), at 74,756.

[42] 15 U.S.C. § 12-27, 29 U.S.C. § 52-53 (2004) (1914).

[43] 15 U.S.C. § 13 (2004) (1914).

[44] 15 U.S.C. § 14 (2004) (1914).

things, situations where a sale of a desired product to a purchaser is conditioned upon the purchaser's agreement not to deal with competitors of the seller (so-called "exclusive dealings") or to purchase a different product as well (so-called "tying arrangements"), in each case where such actions again operate to substantially lessen competition. Section 7[45] deals with mergers and acquisitions which act to substantially lessen competition. We will see the Clayton Act come into play when discussing the AFL-NFL Merger and the *American Needle* case later on.

16.5.2 Formative Caselaw

Antitrust laws have been the principal vehicle used to leverage change in the operation of professional sports leagues, though much of what creates the tapestry of our antitrust jurisprudence comes from judicial interpretation of our antitrust statutes. These decisions animate the statutory text. What follows is a brief review of judicial decisions which helped shape the current treatment of the NFL under our antitrust laws, though it is not an exhaustive treatment.

During the formative years of professional sports in the United States, the initial question to be answered by our courts was whether the antitrust laws even *applied*. This may seem like a preposterous notion in the context of modern professional sports like the NFL which has expansive reach around the world and innumerable manifestations of its economic and cultural power. In fact, with revenues topping $8.5 billion in 2009,[46] if the NFL were its own country it would represent one of the top 135 or so economies in the world, alone surpassing entire gross domestic product of countries like the Bahamas, Nicaragua, and the Cayman Islands.[47] Nevertheless, the issue was not always so cut and dry. Indeed, the United States Supreme Court in 1922 famously held that sporting events like professional baseball were purely local exhibitions involving "personal effort, not related to production" and where any travel across state lines in connection with the games was "a mere incident, not the essential thing."[48] Thus, the Supreme Court found that professional baseball was not engaged in interstate commerce and that the federal antitrust laws were therefore inapplicable to them.

Whatever legal sense this decision made in 1922, the passing years made it less and less applicable to the reality of the growing power and influence of professional sports leagues. Nevertheless, the Supreme Court decided in *Toolson v. New York*

[45] 15 U.S.C. § 18 (2004) (1914).

[46] See Kaplan D (2010) Goodell sets revenue goal of $25B by 2027 for NFL. Sports Bus J. Available at http://www.sportsbusinessjournal.com/article/65348 (last visited July 23, 2010).

[47] See The CIA World Fact Book, available at https://www.cia.gov/library/publications/the-world-factbook/fields/2195.html (last visited July 23, 2010).

[48] Federal Baseball Club of Baltimore, Inc. v. National League of Professional Baseball Clubs, 259 U.S. 200, 209-10 (1922).

Yankees, Inc. in 1953 that Congress had the opportunity for over 30 years to evaluate and correct any evils which followed from the granting of an antitrust exemption in *Federal Baseball* and that Congressional inaction in the intervening period was evidence that it had no intention of making professional sports subject to the federal antitrust laws. The exemption was therefore allowed to persist by this reading of the tea leaves of legislative intent.[49]

The Supreme Court appeared ready to correct its earlier mistakes, at least as the law applied to professional sports *other* than baseball, when it decided *Radovich v. National Football League*[50] in 1957. In *Radovich*, the Court specifically limited the decisions in *Federal Baseball* and *Toolson* to the facts therein (that is, the exemptions they granted from antitrust laws applied only to baseball), once again citing apparent Congressional desire to allow the rulings to stand, and held that the business of professional football *is* subject to federal antitrust laws.[51] Subsequent cases involving professional football have continued to reaffirm *Radovich*'s application.[52]

Though not a case involving professional sports, another case relevant to the development of our antitrust jurisprudence as it applies to professional sports was the Supreme Court's 1984 decision in *Copperweld Corp. v. Independence Tube Corp.*,[53] which posed the question of whether a parent and its wholly owned subsidiary were capable of conspiring with one another in violation of Section 1 of the Sherman Act. This decision would bear heavily on the sports leagues since, if arrangements between a parent and its subsidiary could not violate Section 1 as a matter of law, then leagues would both have a model by which to dodge their greatest antitrust threat and validation from the Supreme Court that the single-entity defense is a tenable position. The Court rejected the idea that a parent and wholly owned subsidiary could constitute separate legal entities capable of conspiring with one another in violation of Section 1, instead finding that the decisions of a parent and its subsidiary are not guided by two separate consciousnesses but *one*.[54]

In reaching this conclusion, the Court looked beyond the form of the organizations involved to the substance of their arrangement to determine whether it is proper to classify the situation as a unilateral or plural action, since the Sherman Act applies very differently to each.[55] In the case of parent and wholly owned subsidiary,

[49] 346 U.S. 356, 364-65 (1953).

[50] 352 U.S. 445 (1957).

[51] *Id*. at 451-52.

[52] *See*, e.g., American Football League v. National Football League, 205F. Supp. 60 (D. Md. 1962) ("It is not disputed that [the attendant professional football leagues and teams] are engaged in interstate commerce and subject to the provisions of the antitrust laws."); *see also*, *Hecht v. Pro Football, Inc.*, 444F.2d 931 (D.C. Cir. 1971) (referring to the "usual applicability of the antitrust laws to any other contract 'by, between or among persons engaging in, conducting, or participating in the organized professional team sports of football.'"

[53] 467 U.S. 752 (1984).

[54] *Id*. at 752, 769.

[55] *Id*. at 767 (citing Monsanto Corp. v. Spray-Rite Services Corp., 465 U.S. 752, 761 (1984) ("The Sherman Act contains a basic distinction between concerted and independent action.").

the Court felt this resembled unilateral action more than the plurality of action demanded by Section 1 as any agreement between them would not be the concerted action of would-be competitors but simply "unilateral behavior flowing from the decisions of a single enterprise."[56] Thus, a true single-entity organization would not deprive the market of the independent centers of decision-making contemplated by our competitive models, but would simply be a unilateral action only reachable to the extent it violates the prohibition on unlawful monopolization under Section 2 of the Sherman Act. Whatever newfound legal ammunition the NFL and other professional sports leagues possessed in the wake of the *Copperweld* decision was short lived. In the next case where the NFL alleged a single-entity defense, the court distinguished *Copperweld* and instead reached back to apply prior precedent characterizing the leagues as joint ventures, placing great weight on the fact that the teams were independently owned, competed with one another for various revenue streams off the field, and were officially organized as a joint venture.[57] The most recent case in which the NFL alleged a single entity defense, prior to *American Needle* discussed later on, was similarly unsuccessful for the NFL, though the court in that case found the relevant inquiry not to be whether there was a "unity of interest" as discussed in *Copperweld*, but rather whether "any of the defendants has pursued interests diverse from those of the cooperative itself."[58]

16.5.3 Standard of Review

With the issue of applicability apparently settled in the collective mind of our courts, and the texture of the judicial analysis coming into focus, the next relevant consideration in our analysis is just what type of judicial scrutiny the NFL and its teams, owners, players, and other constituents will face when these laws are so applied. Generally, courts today will review actions challenged under our antitrust laws under one of two different standards: the "Per Se Rule" or the "Rule of Reason."

Under the Per Se Rule, certain types of agreements are viewed as so inimical to our notions of competition and effectively functioning markets that, once the existence of the agreement itself is proven, the anticompetitive effect is *presumed* and any defenses to the conduct are precluded. Types of agreements subject to this harsh standard are those that one might expect—agreements among competitors to fix

[56] *Id*. at 767. With regard to those single enterprises, Justice Burger was explicit—section 1 was to have no jurisdiction: "it is perfectly plain that an internal 'agreement' to implement a single, unitary firm's policy does not raise the antitrust dangers that section 1 was designed to police." *Id*.

[57] *See* McNeil v. National Football League, 790F.Supp. 871, 879–80 (D. Minn. 1992).

[58] *See* Sullivan v. National Football League, 34F.3d 1091, 1099 (1st Cir. 1994) (citing City of Mt. Pleasant, Iowa v. Associated Elec. Co-op., Inc., 838F.2d 268, 274–77 (8th Cir. 1988) (defining "diverse interests" as "interests which tend to show that any two of the defendants are, or have been, actual or potential competitors.").

prices or divide a market.[59] From an economic standpoint (or at least one of *judicial* economy), this rule reflects a value judgment that the costs of identifying exceptions to the Per Se Rule so far outweigh the costs of condemning conduct that might, under further inspection (i.e., litigation) prove to be acceptable, that it is preferable not to accept defenses for the conduct at all. Said differently, the search for the truly exceptional case (the truly "reasonable" case) is not worth the cost of the investigation, while the costs to society of allowing such conduct to persist while we look into it are comparatively large. Cases warranting per se treatment are often the most egregious examples of market manipulation, and are the ones that generally jump to mind in thinking about violations of our antitrust laws, though they represent a significant minority of cases.

Far more common are agreements or arrangements which are subject to what our courts refer to as "Rule of Reason" analysis. Under the Rule of Reason, courts take a more nuanced approach to evaluating challenged conduct, looking at the proof of anticompetitive effect, whether the challenged restraint on trade was the core of the agreement or ancillary to an otherwise legitimate purpose, whether the competitive harm outweighs the benefits, and whether there were less restrictive means by which these goals could have been accomplished.[60] In more recent years, the judicial and academic analysis has relied increasingly on economic theory (for example, attempting to calculate and taking into more explicit consideration the "deadweight loss" felt by society when transactions which would have increased the collective social utility do not occur due to the monopolistic or collective exercise of market power) in distinguishing anticompetitive from precompetitive conduct.[61]

Specifically with respect to professional sports, where we have discussed that the product on the field is not only the result of competition but of necessary *cooperation*, courts have found that the appropriate standard of review is the Rule of Reason.[62] As the Supreme Court stated in the *NCAA* case, sports are a unique case in that they "would be completely ineffective if there were no rules on which the competitors agreed to create and define the competition to be marketed."[63] Therefore, for example, when a plaintiff comes forward to challenge the NFL and its teams for their agreement not to compete for the services of a particular running back

[59] *See*, e.g., United States v. Socony-Vacuum Oil Co., Inc., 310 U.S. 150 (1940) (finding that combinations formed for the purpose of raising, depressing, fixing, pegging, or stabilizing price of commodity is illegal per se).

[60] *See*, e.g., Addyston Pipe & Steel Co. v. United States, 85F. 271 (6th Cir. 1898); Rothery Storage & Van Co. v. Atlas Van Lines, Inc., 792F.2d 210 (D.C. Cir. 1985).

[61] See Gavil AI, Kovacic WE, Baker JB (2002) Antitrust Law in Perspective 27.

[62] *See,* e.g., National Hockey League Players' Ass'n v. Plymouth Whalers Hockey Club, 325F.3d 712, 719 (6th Cir. 2003) (citing an earlier case in noting that "'courts have consistently analyzed challenged conduct under the rule of reason when dealing with an industry in which some horizontal restraints are necessary for the availability of the product' such as sports leagues.").

[63] *NCAA*, 468 U.S. at 101.

through the application of the league's player eligibility rules, a court will undertake an analysis of the restraint and its effects and a weighing of the attendant facts (bolstered by current economic thinking and an eye toward maximizing consumer welfare) in deciding whether such an agreement is one we as a society will bear.[64] While the effect of such an arrangement by NFL teams turned out to be dramatic and life-altering for former Ohio State running back turned convicted felon Maurice Clarett, one can imagine the effect on sports leagues generally (and our ultimate enjoyment of them) if they were not able to agree on eligibility rules or mechanisms of talent allocation such as a draft, which is why such agreements often withstand legal challenge.[65] Armed with a basic understanding of the economic structure of the NFL and the legal backdrop against which it and its constituents make their decisions, let us proceed to examine a few seminal applications of these ideas from the NFL's infancy, adolescence, and its not-so-distant past.

16.6 The Economic Implications of Applying Our Antitrust Laws

It can at times be difficult to see how a piece of legislation or judicial decision really affects most of our day-to-day lives, even those made by the Supreme Court, which may partially explain why judicial confirmation hearings for potential Supreme Court justices in recent years have seemed to focus less and less on judicial philosophy and more and more on the salacious details (real or imagined) of the nominee himself or herself (and why hearings for lower court appointments are barely noticed by the public at all).[66] Nevertheless, legislative action such as the Sherman Act and the Clayton Act, and the judicial and administrative decisions which interpret them, are not made in a vacuum, but can have very real consequences for the functioning of markets, the behavior of firms, and, as we analyze below, the operational realities of professional sports leagues like the NFL.

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[64] *See*, e.g., Reiter v. Sonotone Corp., 442 U.S. 330, 343 (1979) (implementing a "consumer welfare test" in its analysis and characterizing the Sherman Act as "designed … as a 'consumer welfare prescription.'").

[65] *See* Clarett v. NFL, 369F.3d 124, 143 (2d. Cir. 2004) (upholding NFL rule which limited player eligibility to those who are three seasons removed from their high school graduation). *But see* Kapp v. National Football League, 586F.2d 644 (9th Cir. 1978) (affirming a lower court ruling that the "Rozelle Rule," which required a new team to compensate the old team with players, draft picks and/or money upon signing a player from the old team (deterring the signing of free agents), was violative of Section 1 of the Sherman Act).

[66] Of course, placing television cameras in a room with United States Senators likely accounts for just as much, if not more, of the devolution, not to be cynical about the "most deliberative" legislative body in the world.

16.6.1 The Sports Broadcasting Act

Before the early 1950s, the broadcast rights to sporting events were the property of the individual teams participating in it, resulting in teams competing against one another to have their games broadcast and there was little to fear from the antitrust laws.[67] However, as television developed and was adopted by more and more homes, leagues like the NFL began to appreciate the revenue potential of pooling the individual broadcasting rights into one package and the effect that could have in creating a more equitable distribution of revenues among constituent teams.[68] Rather than have the teams locked in fratricidal engagements, league-wide revenues could be increased, revenues shared, and internecine battles spared through collective action.

In 1953, the NFL sought to bundle its teams' broadcast rights (prohibiting sales by individual teams) and to limit the broadcast of out-of-market games into the "home territory" (a 75-mile radius around a team's home city) of another team on a day when such other team was either playing or broadcasting a game in its home territory, an action that was swiftly challenged by the United States Department of Justice (the "DOJ") in a case which we will refer to as "NFL I," on the grounds that such an agreement was an unreasonable restraint on trade in violation of Section 1 of the Sherman Act.[69] The court in NFL I, noting that the NFL "was truly a unique business enterprise," nevertheless found under Rule of Reason analysis that the league's prohibition on individual sales by teams was an unreasonable restraint of trade.[70] Interestingly, the court also found that the NFL prohibition against broadcasting in another team's home area on a day when such other team was playing *was* permissible under antitrust laws, despite noting that it appeared to constitute a clear case of "market division" (which generally subjects the agreement to per se treatment), since the rule's purpose did not appear to be the restraint of competition and that it had a reasonable business justification (namely, the protection of gate receipts, which at the time still accounted for the vast majority of revenues[71]).[72] Thus, the restraint was ancillary to an otherwise legitimate business goal of the league and, upon Rule of Reason analysis, was allowed to stand.

Nevertheless, after NFL I, pooled broadcast agreements which prohibited individual sales of broadcast rights were impermissible and teams were cast back into a world where they were forced to compete individually. With the rise of a competitor in the form of the American Football League (the "AFL"), however, the NFL again sought to pool its broadcast rights in response to the AFL's efforts in the same regard pursuant to a contract between the AFL and the American Broadcasting

[67] Weiler PC, Roberts GR (2004) Sports and the law, 3rd edn, p 634.

[68] *Id*.

[69] *National Football League*, 116F. Supp. at 319.

[70] *Id*. at 327.

[71] Weiler and Roberts, *supra* note 67 at 431.

[72] *Id*. at 325–326.

Company ("ABC").[73] The issue of pooled broadcast rights (and the revenue sharing implicit therein) was an emergent issue for the NFL in the late 1950s and early 1960s as the revenue disparity in the sales of broadcast rights between large market teams in New York, Chicago, and Los Angeles and small market teams like Green Bay was becoming significantly larger.[74] In 1961, the NFL brought a proposed agreement with CBS before the judge and court which had decided NFL I 8 years earlier to seek a declaratory determination on the issue of whether the agreement violated the Sherman Act. The court, in a case which we will refer to as "NFL II,"[75] again found that the agreement violative of Section 1 as it effectively eliminated all competition between the teams with respect to the sale of broadcast rights.[76]

In response to these adverse decisions, the NFL successfully lobbied Congress[77] to enact an exemption from the antitrust laws for bundled sales of sports broadcast rights, which Congress did in 1961 with the passage of the *Sports Broadcasting Act of 1961* (the "SBA"), which states in relevant part:

> The antitrust laws, as defined in Section 1 of the [Sherman] Act … shall not apply to any joint agreement by or among persons engaging in or conducting the organized professional team sports of football, baseball, basketball, or hockey, by which any league of clubs participating in professional football, baseball, basketball, or hockey contests sells or otherwise transfers all or any part of the rights of such league's member clubs in the sponsored telecasting of the games of football, baseball, basketball, or hockey, as the case may be, engaged in or conducted by such clubs.[78]

Thus, arrangements for sales of pooled over-the-air broadcasting rights are exempted from Section 1's scrutiny.

The economic implications of this exemption are (and have been) tremendous. By centralizing the derivative product of broadcast rights, NFL teams were freed from having to compete with one another for space on what was, at the time of passage, a very limited universe of channels showing games (ABC, CBS, NBC). Thus, the demand and supply interaction prior to the SBA was such that the supply of potential games was comparatively large to the demand of broadcasters to show the games in local markets.

Following the passage of the SBA, with the NFL permitted to bundle its teams' broadcast rights (and, importantly, prohibit sales by individual teams), the supply and demand interaction was artificially and effectively flipped. In the post-SBA world, demand presumably stayed relatively constant in the short term, but the source of supply was reduced substantially, effectively making the AFL and NFL oligopsonists in the market for professional football game broadcasts. Basic economic

[73] *Id*. at 641.

[74] *Id*.

[75] United States v. National Football League, 196F. Supp. 445 (E.D. Pa. 1961).

[76] *Id*. at 446–447.

[77] Anderson DL (1995) The sports broadcasting act: calling it what it is—special interest legislation. Hastings Comm Ent Law J 17:945, 949 (discussing lobbying efforts by the NFL).

[78] 15 U.S.C. § 1291

theory predicted what would happen next: the price charged by the seller (NFL) would increase and the supply would decrease, which is precisely what did occur in local television markets in the aftermath of the SBA.[79] Indeed, the NFL's initial television contract with CBS referenced above only garnered the NFL $4.65 million per year (or $3,20,000 for each of the 14 teams),[80] while the current NFL agreements with CBS, NBC, Fox, ESPN, and DirecTV, albeit not adjusted for inflation, are worth approximately $3.7 billion per year (or approximately $116 million per team).[81] Even adjusting for inflation, real income from television increased from approximately $16 million (in 1982–1984 dollars) to over $779 million in 1993, an increase of over 4,800%, and revenues have only grown exponentially since.[82] Broadcasting revenues, by the early 2000s, came to represent over two-thirds of the NFL's total annual revenues, a stunning turn of the tables with gate revenues in the 50 or so years since the passage of the SBA. An illustrative counterexample can be found in looking at the NCAA, where the courts' termination of the NCAA's central control of televised college football games resulted in a substantial increase in the supply of games on television[83] and a related reduction in the amount of advertising revenue derived generally from the broadcast of football games.[84]

Economic theory would argue, then, that the SBA has made the market for broadcast rights of sporting events (including NFL games) less efficient and led, due to its grant of market power to the NFL in this space, to a transfer of wealth (or at least utility) from society to the NFL. A dramatic illustration of this effect can be seen in analyzing NFL team values and franchise expansion fees in recent years as revenues from television have increased geometrically. In the early 1990s, at a time when the NFL operated under a broadcast agreement with CBS for approximately $265 million per season, the NFL set an expansion fee for new franchises in Jacksonville and Carolina at $140 million, which was also approximately how much business mogul Wayne Huizenga paid for the established Miami Dolphins franchise around the same time. However, in 1993, Fox won the bidding for the NFL's Sunday afternoon NFC games for $400 million per season (over CBS's bid of $300 million).[85] Shortly thereafter, the New England Patriots were sold for $160 million, the Philadelphia Eagles were sold in 1994 for $185 million, the Tampa Bay Buccaneers

[79] *See* American Needle, Inc. v. National Football League, Amicus brief of economists in support of petitioner at 13–14 (Sept 24, 2009).

[80] Weiler and Roberts, *supra* note 67 at 431.

[81] Badenhausen K, Ozanian MK, Settimi C (2009) Recession tackles NFL team values. Forbes. Available at http://www.forbes.com/2009/09/02/nfl-pro-football-business-sportsmoney-football-values-09-values.html (last visited July 25, 2010).

[82] Fort R, Quirk J (1995) Cross-subsidization, incentives, and outcomes in professional team sports leagues. J Econ Lit 33:1265, 1291.

[83] American Needle, Inc. v. National Football League, Amicus Brief of Economists in Support of Petitioner at 14 (Sept. 24, 2009).

[84] United States Football League v. National Football League, 842F.2d 1335, 1357 (2d Cir. 1988).

[85] Weiler and Roberts, *supra* note 67 at 673–674.

were sold in 1995 for $195 million, the expansion fee for the "new" Cleveland Browns was set at $530 million in 1998, and it took $700 million to establish the Houston Texans in 2001.[86] In completing its annual analysis of NFL franchise values in September 2009, Forbes Magazine noted that the average enterprise value (equity plus debt) of teams in the NFL was $1 billion.[87]

In addition, freed from competition and treated to the spoils of revenue sharing, the SBA helped secure a reality in which a team's financial benefits from the sale of broadcast rights were decoupled to a certain extent from its efforts on and off the field. The marginal impact of signing and paying better players, employing better coaches, or investing in better training is blunted when teams are not required to suffer the full consequences for not competing to put the best team on the field. This is not to say that teams would be satisfied being losers year after year (indeed, a significant portion of each team's revenues comes from activities for which they set the price individually and so they must be at least somewhat responsive to demand)[88] but, on the margin, the SBA would seem to distort the market incentives that would force teams to compete in this space. This becomes an especially acute issue in today's NFL where revenue sharing in the NFL recently topped $6.5 billion.[89]

A few words about the scope and evolving influence of the SBA bear some mention here. First, as a general matter, courts read exemptions to antitrust laws very narrowly and so we must do the same. As the Court of Appeals for the Seventh Circuit put it in a case involving the National Basketball Association's broadcast policies, "courts read exceptions to the antitrust laws narrowly, with beady eyes and green eyeshades."[90] As a related matter, the legislative history of the SBA suggests, and contemporaneous statements by the NFL at the time concur, that the SBA's exemption was only to apply sales to a "sponsored television network" (that is, telecasts on the free broadcast channels) and "does not apply to closed circuit or subscription television."[91] The Court of Appeals for the Third Circuit confirmed as much in a 1999 case involving the NFL's satellite television product *Sunday Ticket*.[92]

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[86] *Id*. at 674.

[87] Forbes, *supra* note 49.

[88] *See* American Needle, Inc. v. National Football League, Amicus Brief of Various Players' Associations in Support of Petitioner at 9 (Sept. 25, 2009) (stating its findings that of the $7.5 billion generated by NFL teams in 2008, approximately $4.5 billion came from revenue sources whose prices were set by the teams individually).

[89] *See* Associated Press (2009) NFL to cut $100 million annual revenue-sharing program. Available at http://www.nfl.com/news/story?id=09000d5d814bea04 (last visited July 23, 2010).

[90] Chicago Pro. Sports Ltd. Partnership v. Nat'l. Basketball Ass'n., 961F.2d 667, 672 (7th Cir. 1992).

[91] See *Telecasting of Professional Sports Contests*: Hearing before the Antitrust Committee of the House Committee on the Judiciary on H.R. 8757, 87th Cong. 1st Sess. at 4, 36 (Sept. 13, 1961). *See also*, Zimbalist A (2004) The practical significance of baseball's presumed antitrust exemption. Ent Sports Law 22:1, 24 (quoting Commissioner Pete Rozelle as saying "[t]his bill covers only the free telecasting of professional sports contests and does not cover pay TV.").

[92] Shaw v. Dallas Cowboys Football Club, 172F. 3d. 299, 303 (3d. Cir. 1999) (holding that the sale of games in a satellite programming package did not fall within the scope of the SBA's exemption).

Read together, these concepts suggest that, as the proliferation of new media continues and the relative piece of the viewership pie dominated by the over-the-air broadcasters lessens, the economic effect of the SBA exemption will lessen with it. This is not to suggest that cable, internet, or satellite broadcasting will harm the NFL's bottom line, as increased accessibility is likely to contribute to the NFL's continued strength, but it is nevertheless important to understand the limits of the NFL's exemption from competition in the expanding media space.

16.6.2 The AFL-NFL Merger

In 1966, in light of the pending AFL-NFL merger and after another successful lobbying effort by the NFL, Congress passed legislation which added professional football leagues to section 501(c)(6) of the Internal Revenue Code and an amendment to the SBA which added the language below to the end of the SBA, immediately following the passage quoted above:

> In addition, such laws shall not apply to a joint agreement by which the member clubs of two or more professional football leagues, which are exempt from income tax under section 501(c)(6) of the Internal Revenue Code of 1986, combine their operations in expanded single league so exempt from income tax, if such agreement increases rather than decreases the number of professional football clubs so operating ….[93]
> The legislative history of this amendment reflects that its "sole effect … is to permit the combination of the two leagues to go forward without fear of antitrust challenge based upon joint agreement …."[94]

As with the effects of the passage of the SBA above, one would expect that the consolidation of the two major professional football leagues, thereby creating a monopoly in the market for professional football in the United States where there was once competition, would follow tenets of basic microeconomics: namely, the monopolist will increase prices, supply (in this case, of football teams and games) would decrease to a new equilibrium where the monopolist's marginal revenue equals its marginal cost. This natural market flow was muted to a certain extent by the text of the statute permitting the merger, however, which permitted the merger so long it *increased* the number of professional football teams in operation.[95] While Congress' head might have been in the right place in trying to prevent some of the wealth transfer that follows the monopolization of a formerly competitive market, it may have been that this provision was too blunt an object to accomplish the apparent goals.

In forcing the new monopoly to at least retain the combined 26 teams in existence at the time of the merger, the NFL was thereby compelled to maintain teams in all (or substantially all) of the best markets in which to locate a professional

[93] 15 U.S.C. § 1291.

[94] 1966 U.S.C.C.A.N. 4378.

[95] 15 U.S.C. § 1291.

football franchise, including two teams in New York. This effectively created a congressionally mandated barrier to entry for any potential competitor league, significantly strengthening the monopoly status of the NFL. Left to its own devices, the combined NFL may well have eliminated a handful of teams, extracted monopoly profits for a certain amount of time, and thereby invited a competitor whose potential viability would be bolstered by the then availability of fertile football markets. The effect of the amendment permitting the merger was to not only help erect the barriers to entry but it also helped cleanse the NFL of any insinuation that it was occupying these "extra" markets in an illegal attempt to maintain its monopoly status in violation of Section 2 of the Sherman Act.

Also relevant for legal and economic purposes is that, during the hearings preceding the passage of the bill, then NFL Commissioner Pete Rozelle testified to Congress that, due to the number of teams in the combined league, the NFL would require games to be broadcast on "at least two networks" in defending against arguments that the merger would result in the overall reduction in the number of televised games.[96] Whether this was simply a sincere defense in response to legitimate congressional concerns about the effect of granting what they knew to be monopoly status on the NFL or whether this was Pete Rozelle asking Congress not to throw the NFL into the proverbial briar patch, we do not know. In any event, following the merger, the NFL occupied precious Sunday afternoon broadcast slots on two of the three networks. Similar to the analysis above with regard to available franchise locations, this reality helped construct a material barrier to entry to a potential rival, who would be forced in all likelihood to undercut the NFL's price and contend with established contractual relationships.

The reality which followed the AFL-NFL merger comports with much of what we would expect from the economic theory laid out above. The consolidated NFL grew in the succeeding years into an immensely profitable business enterprise, able to wield significant market power in many spheres of its business (as we will analyze in the *Raiders* cases below) and without a serious rival for much of its existence (as we will see in the *USFL* cases below). Over time, despite the monopoly profits that the NFL has been able to achieve, no alternative league has truly threatened to unseat them, which speaks volumes about the significance of the merger exemption granted by Congress and the implicit barriers to entry contained therein.

16.6.3 Oakland/Los Angeles Raiders Cases

The issues which arose amid the conflict between Al Davis, the then and current owner of the Oakland Raiders, and the NFL over the issue of franchise relocation (a conflict which yielded no less than ten judicial decisions, including the most important one which we will refer to herein as "Raiders I"[97]) had their genesis in

[96] Weiler and Roberts, *supra* note 67 at 728.

[97] Los Angeles Mem'l Coliseum v. National Football League, 726F.2d 1381 (9th Cir. 1981).

1978 in Los Angeles, approximately 370 miles to the south of the Oakland Coliseum where the Raiders played their home games.

In 1978, Carroll Rosenbloom, the owner of the Los Angeles Rams, decided to move the Rams from the Los Angeles Coliseum to nearby Anaheim, lured away by a lucrative lease arrangement with the city and thus leaving the Los Angeles Memorial Coliseum (the "LA Coliseum") without a tenant.[98] This placed the LA Coliseum in a precarious position as, under Rule 4.3 of Article IV of the NFL's Constitution, as then drafted, the prior approval of NFL owners was required for a team to relocate into another team's home territory (the 75-mile area around the city where a team plays its home games), which clearly included Los Angeles with respect to the Rams new "home territory" in Anaheim.[99] The LA Coliseum made efforts to mount a legal challenge to Rule 4.3 in 1978, but the federal district court for the Central District of California found that the LA Coliseum had failed to show that it was reasonably likely that (1) they and the new transfer team would be able to agree to terms on a lease and (2) the NFL owners would vote down the move.[100] Therefore, in the opinion of the court, the LA Coliseum did not yet have a claim and their complaint was dismissed with leave to amend it.[101] Interestingly, at the time of this first legal challenge, Rule 4.3 required *unanimous* consent of the other owners for a team to relocate to the home territory of another team but, likely fearing antitrust repercussions for maintaining this kind of control, the NFL amended the rule in 1978 to only require three-fourths of the owners.[102]

It was also around this same time that Al Davis, on behalf of the Oakland Raiders, had reached impasse in his negotiations with the city of Oakland regarding a renewal lease for the Raiders with respect to the Oakland Coliseum.[103] On March 1, 1980, Al Davis signed an agreement which would bring the Raiders to Los Angeles but, after presenting the plan to the NFL ownership, it was voted down 22-0, with several abstentions.[104] The Raiders then joined the LA Coliseum's earlier lawsuit and they reinstituted it, arguing among other things that Rule 4.3 violated Section 1 of the Sherman Act.[105]

In defense of its position, the NFL argued at length that it was in fact a "single entity" for purposes of antitrust enforcement which would mean, under the *Copperweld* decision discussed in Sect. 16.4 above, that the NFL teams were incapable of violating Section 1 of the Sherman Act in the same way that divisions of a

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[98] Weiler and Roberts, *supra* note 67 at 577.

[99] *See Raiders I* at 1385.

[100] *See* Los Angeles Mem'l Coliseum v. National Football League, 468F. Supp. 154, 162 (C.D. Cal. 1979).

[101] *Id*.

[102] *See Raiders I* at 1385.

[103] Weiler PC and Roberts GR (2004) Sports and the law, 3rd edn, p 577.

[104] *See Raiders I* at 1385.

[105] *Id*.

single business are unable to do so.[106] The Ninth Circuit Court of Appeals in *Raiders I* rejected this argument, citing numerous reasons why the NFL should be considered many distinct businesses rather than one entity: independent ownership of franchises, profits, and losses are not shared between teams, disparities in profitability which the court took to come from independent management decisions, league rules which were created and governed by the owners rather than directly by the NFL, and competition off the field for players coaches and management personnel.[107] After dispensing with the single entity issue, the Court undertook a Rule of Reason analysis to determine the reasonableness of the restraint, finding that it was overly restrictive as the rule effectively conveyed a monopoly to teams in their home territories and served to preclude competition between stadium venues for teams, which competition in either area would inure to the benefit of NFL fans.[108] The apparent destruction of consumer welfare inflicted by the rule was ultimately fatal in the court's mind, despite the NFL's argument that the restraint was only ancillary to the production of NFL football.

The regime under Rule 4.3 prior to *Raiders I* thus had the effect of insulating NFL teams from competition within a broad geographic home area, allowing teams to charge their fans effectively monopoly prices for gate admission and concessions without fear of retribution from a competitive market. The rule also precluded competition among venues and stadia that otherwise might have taken place if teams could be lured to move into another team's area. *Raiders I* effectively chipped away at the insulation from competition that teams formerly enjoyed, keeping at least a theoretical check on teams' abilities to extract monopoly value and shifting a certain amount of utility back to the fans.

That said, Article IV of the NFL's Constitution, as currently drafted, still vests substantial control and rights approaching monopoly status to teams within their home areas and to the NFL on issues involving relocation, so the distribution of utility between fans and teams as a result of *Raiders I* may not have shifted from teams to fans to the degree that the theory might suggest, at least as a result of the threat of franchise relocation.[109] Indeed, despite the theoretical lowering of hurdles to direct competition within each team's geographic areas, very few such moves have even been threatened and none actually consummated since the AFL-NFL Merger, other than by a team to occupy a location which had formerly supported a team in such close proximity (e.g., the Raiders moving back to Oakland (within the San Francisco

[106] *Id*. at 1387.

[107] *Id*. at 1390.

[108] *Id*. at 1395.

[109] Section 4.3 of Article IV of the NFL Constitution currently states: "The [NFL] shall have exclusive control of the exhibition of football games by member clubs within the home territory of each member. No member club shall have the right to transfer its franchise or playing site to a different city, either within or outside its home territory, without prior approval by the affirmative vote of three-fourths of the existing member clubs of the [NFL]."

49ers' home territory) from Los Angeles in 1995 and the Cleveland Browns moving to Baltimore (within the Washington Redskins' home territory) to become the Ravens in 1996, which had hosted the Colts franchise as recently as 1984). Moreover, the chances of seeing such direct competition in the future, even in areas which have not historically supported multiple teams, are relatively small. There are only a small number of such 75-mile home territories which could reasonably support more than one NFL franchise. Of such territories, New York already has two franchises, making it an unlikely candidate for another, and Los Angeles currently has no team, so there would not initially be any home territory issue. Whatever the economic effect of the *Raiders I* decision in theory, as a practical matter it is unlikely to shift the balance of utility much in favor of NFL fans as a result of a threat of direct competition from another NFL franchise.

The repercussions of *Raiders I* extend well beyond the protection of (rather than protection *from*) direct competition between NFL teams in close geographic proximity, however. In affirming that the NFL is indeed a joint venture of independent members for antitrust purposes, the analysis and conclusions of *Raiders I* bear on substantially all of the collective decisions made by the NFL and its teams, from decisions regarding player eligibility (effectively an agreement not to compete for the services of "ineligible" players) to decisions regarding the sale of broadcast rights and other intellectual property (effectively agreements not to compete with each other in those markets or with respect to such products). As we have seen, the unique nature of sports requires a certain amount of collective action, but to the extent the collective action extends beyond core elements which are necessary for the product to be available at all, such action wades into more dangerous waters from an antitrust perspective. The conclusions of the courts in *Raiders I* with respect to the NFL's argument that it was a single entity helped ensure that the NFL's collective decision-making would be held to greater antitrust scrutiny and, in turn, helped preserve a comparatively greater amount of competition among NFL teams in nearly every aspect of their operation, the benefits of which inure to society generally and to patrons of the NFL specifically.

16.6.4 USFL v. NFL Cases

Among the major professional sports leagues in the United States, the NFL has been the recipient of the most persistent and the strongest challenges from potential rivals, from, for example, the All-American Football Conference in the 1940s to the American Football League in the 1960s and the World Football League in the 1970s. The NFL was once again challenged by an upstart league called the United States Football (the "USFL") in the early 1980s, initially in the market for coaching and playing talent, then eventually in the broadcast space and, ultimately, in the courts.

The USFL was founded in May of 1982 by David Dixon, a New Orleans antique dealer seeking to carve out a piece of the growing economic pie that was professional football from the persistent supremacy of the NFL. An initial decision was made by the USFL to establish 11 of its initial 12 franchises in direct geographic competition with NFL counterparts by placing them within the same cities as such established NFL franchises (the other being Birmingham, Alabama), though the USFL was founded as a spring football league in the hopes of leveraging existing fan interest and media market strength in these established football locales while avoiding a head-to-head match-up with the stronger league. The USFL played its inaugural games in the spring of 1983 and had some early successes both in terms of television viewership and in attracting some of the up and coming talent, such as consecutive Heisman Trophy winners Herschel Walker, Doug Flutie, and Mike Rozier and future NFL Hall of Fame inductees Jim Kelly, Steve Young, and Reggie White. Nevertheless, following three seasons which eventually saw sliding television ratings, fan support, losses totaling over $200 million (largely due to outsized spending on player salaries), and an ill-conceived attempt to force a merger with the NFL by scheduling a slate of games in the fall of 1986, the USFL played its final games in July of 1985.[110]

In the belief that the NFL had played a material (and illegal) role in the USFL's demise, the USFL and certain of its member teams and former owners filed suit in the Southern District of New York against the NFL, its commissioner Pete Rozelle, and 27 of the NFL's 28 member clubs,[111] alleging violations of Sections 1 and 2 of the Sherman Act, common law claims of intentional interference with contract, intentional interference with prospective business and interference with contractual relations, and making a demand for treble damages topping $1.7 billion.[112] The USFL contended that the NFL, through the use of its monopoly power in the market for professional football in the United States and the submarket for the network broadcasting rights to exhibitions thereof, unlawfully prevented the USFL from having access to television networks (by contracting with the three main networks), adequate stadium facilities (by entering into lease agreements with the best venues), game officials (though full-year service contracts), investors (through disparaging comments), and public interest generally, each of which was necessary in the USFL's estimation to compete with the NFL.[113] The USFL further contended that the NFL allegedly leveraged such monopoly power through a conspiracy involving the NFL, its constituent teams, its commissioner, and the complicity (knowing or unknowing) of the major television networks in an attempt to bankrupt the USFL.[114]

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[110] United States Football League, et. al. v. National Football League, et al, 842F.2d 1335, 1340 (2d Cir. 1988). The USFL's plans to directly compete with the NFL by scheduling games for the fall of 1986 were abandoned following the jury verdict in the trial court.

[111] The Los Angeles Raiders, Ltd. was not named as a defendant in the complaint. *Id.* at 1341 n.2. This is possibly due to the fact that Raiders owner Al Davis was the only NFL-affiliated witness who agreed to testify on the USFL's behalf without a subpoena and who was one of the advocates of the theory that the NFL and the City of Oakland had conspired to injure the USFL's Oakland franchise.

[112] *Id.* at 1341; *see also* United States Football League v. National Football League, 634F. Supp. 1155, 1176 n.3 (S.D.N.Y. 1986).

[113] 634F. Supp. at 1158–1166.

[114] *Id.* at 1176; *see also id.* at 1160–1166, 1180–1184.

A flurry of litigation followed, including a number of motions and decisions during the pendency of the initial trial. The NFL argued in its defense first that the relevant television submarket in question was the market for *entertainment broadcasting* generally (rather than simply broadcasts of professional football) and, second, that it had not monopolized either such submarket or the market for professional football because (1) the NFL's contracts with the three major broadcast networks were not exclusive, (2) any failure by the USFL to secure a fall television contract was a result of an independent judgment by the broadcast networks that the USFL was an inferior product to the NFL and of the USFL's ill-conceived strategy to attempt to force a merger with the NFL, (3) the NFL never acted to pressure any television network to not carry USFL games by threatening nonrenewal of their contract with such network or assignment of less attractive games to them, (4) the NFL never sought to "conquer" or bankrupt the USFL as had been depicted in a presentation to NFL executives given by Harvard Business School Professor Michael Porter and presented in evidence at trial, (5) the NFL never sought to injure the USFL Oakland franchise or preclude its New Jersey franchise from playing games in New York as had been alleged by the USFL and, finally, (6) the losses ultimately suffered by the USFL were self-inflicted wounds following from its own mismanagement.[115]

The legal gladiating was interrupted initially with a jury verdict in the trial court finding, importantly, that the NFL *was* in possession of monopoly power in the relevant market (that for major league professional football in the United States) and that the NFL *had* willfully acquired or maintained its monopoly power in such market in violation of Section 2 of the Sherman Act, causing injury to the USFL in the process.[116] Nevertheless, the jury awarded the USFL only $1.00 in damages, apparently concluding that whatever the NFL's anticompetitive and illegal conduct, the USFL was either not actually injured thereby and/or that the USFL's own actions and mismanagement of its business had resulted most directly in its ultimate downfall.[117] Additionally, the jury rejected the USFL's other claims, namely, finding that the NFL had not monopolized a relevant *television* submarket (nor attempted to do so), the NFL had not completed an act in furtherance of a conspiracy to monopolize (or engage in any conspiracy in restraint of trade), the NFL's television contracts were not unreasonable restraints of trade (nor did the NFL control access to any "essential facilities" in the form of television networks or stadia), and that the NFL did not interfere with the USFL's ability to obtain spring and fall network television contracts.[118]

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[115] 842F.2d at 1343.

[116] *United States Football League v. National Football League*, 842F.2d at 1341.

[117] *See United States Football League v. National Football League*, 644F. Supp. at 1054 (jury instructed to make a "quantifiable distinction between losses the USFL had suffered as a result of the NFL's misconduct and losses the USFL had suffered as a result of other factors," including the USFL's business decisions and its own financial mismanagement).

[118] United States Football League v. National Football League, 842F.2d at 1341.

The Court of Appeals for the Second Circuit affirmed the decision of the trial court, finding in relevant part that the Sports Broadcasting Act did not limit the NFL to broadcast its games on only one network, that sufficient evidence existed which would permit the jury to find that the NFL's agreements with the three broadcast networks were not an anticompetitive hurdle to the USFL's ability to compete for a network broadcast contract and that there was more than enough evidence at trial for the jury to reasonably conclude that the USFL's failures were as a result of its own mismanagement.[119] Next, the court held that sufficient evidence was presented at trial for the jury to find that the "dilution effect," a theory developed by CBS and deputized into the claims of the USFL which asserted that the loss in advertising revenues from NFL games resulting from the increased volume of games broadcast with the addition of the USFL (which would in turn make it economically infeasible for a network to carry more than just NFL games), would not be present in many instances (e.g., after the current NFL contracts expired or immediately in the case of a network like ABC which at the time did not carry any Sunday afternoon football games) and, on the whole, would not preclude the USFL from competing for a network contract.[120] Finally, the court affirmed the lower court's rejection of the USFL's demand for an injunction against the NFL pursuant to Section 16 of the Clayton Act, which asked the lower court to grant the USFL membership in the NFL, split the NFL into two separate leagues, and limit each to broadcast games on one network or institute a prohibition on the NFL from broadcasting its games in more than one afternoon time slot on Sunday.[121] In affirming such rejection, the court reiterated that the structure of the NFL was specifically authorized by the statute permitting the AFL-NFL merger and that it does not create an unlawful barrier to entry.[122] Moreover, the court chastised the USFL for the request, stating that it amounted to an attempt to achieve by court decree what it could not achieve through competition, that new leagues must be prepared to make the investments of time and effort necessary to develop fan and media interest and that the Sherman Act does not declare an industry structure unlawful simply because it does not allow a new entrant to achieve parity immediately.[123]

The *USFL* cases, particularly the analysis and conclusions set forth in the opinion by Judge Winter in the Second Circuit, have given rise to significant economic effects in their aftermath. Despite the jury's finding that the NFL did possess market power in the market for professional football in the United States, a distinction with which few would argue today, the jury went on to reject the USFL's claims that the NFL had willfully acquired or maintained monopoly power in the television submarket and found that the NFL's actions in contracting with all of the networks and

[119] *Id*. at 1355.

[120] *Id*. at 1355–1357.

[121] *Id*. at 1379–1380.

[122] *Id*.

[123] *Id*. at 1379-80.

collectively undertaking to compete with the USFL (which the jury did find to constitute a contract, combination, or conspiracy to exclude competition in professional football, though not an *unreasonable* restraint of trade) were not precluded by Sections 1 or 2 of the Sherman Act. This, combined with the strong language of Judge Winter, provided the NFL with a relatively permissive legal landscape in which to operate.

In theory, the NFL was relatively freer, following the *USFL* cases, to occupy the broadcast time slots, fertile football cities, stadia, and otherwise accumulate greater dominion over the crucial inputs to production of professional football, thereby effectively "taking the air out of the ball" with regard to competition. In practice, this is precisely what we have seen. Since the downfall of the USFL in the mid-1980s, no new leagues have risen to seriously compete with the NFL, or any of the other major professional sports in the United States. Indeed, "it appears that the market position for the four major sports leagues is so well entrenched that only the most brave or foolhardy would try to compete directly against any of them at the highest level," no doubt aided by the defenses provided them by the *USFL* cases.[124]

In addition, the jury's verdicts and language of Judge Winter's opinion set a very high bar for what conduct by the NFL would be considered violative of our antitrust laws. The NFL would then be expected to able to extract monopoly profits from its operations and service output at levels below what we would expect to see in a competitive market. While it is probable that a competitive league might increase the net number of professional football games produced and broadcast, the reality that the NFL is currently able to extract monopoly rents for its output is a virtual certainty. As we have discussed previously, the NFL's contracts with broadcasters are, collectively, the richest in professional sports (worth over $21 billion in revenue to the NFL in their current iterations), NFL franchise values have increased geometrically in recent years following the increases in television revenues and other arrangements.

Economic theory would suggest, however, that the extraction of monopoly profits would rise over time to levels which would invite competition in the relevant market. One might think this would even be especially likely today as the proliferation of new media and channels through which a new league could reach potential fans has exploded with the penetration of the internet, satellite television, and cable. Thus, a new league would not be limited to competition with the NFL for a finite number of slots on the few free broadcast networks. Ironically, the new media realities may cut both ways, making it harder for a new league to claim that the incumbent has monopoly power in a relevant media market given the number of alternative channels. Instead, with apparent expansion in the definition of the relevant market, the actors in the market, even an incumbent sports league, begins to look more and more atomistic and its actions therefore more and more reflective of vigorous competition rather than the unlawful wielding of monopoly power. In light of the barriers to entry, which already exist in the creation of a viable professional football league, which are fortified and permitted to be made taller and stronger following the *USFL*

[124] Weiler and Roberts, *supra* note 67 at 736.

cases, especially in light of the new media realities discussed above, we can expect the NFL to only tighten its monopoly grip and continue to collect monopoly rents.

16.6.5 American Needle

The *American Needle* case, a proceeding which is still ongoing at the time of this writing, involves the efforts of NFL member teams to collectively license their respective intellectual property rights, specifically the right to implement such intellectual property in the production of hats and other headwear. Prior to the early 1960s, each NFL team made its own arrangements regarding the licensing of its intellectual property (logos, team names, mascot likenesses, etc.) and the marketing of items bearing such intellectual property.[125] In 1963, the NFL teams sought to collectively promote the NFL brand and to that end formed National Football League Properties ("NFLP"), a separate corporate entity tasked with (1) developing, licensing, and marketing the intellectual property owned by the NFL teams and (2) conducting advertising campaigns on behalf of the NFL and its constituent teams.[126]

From 1963 until the year 2000, NFLP granted nonexclusive licenses to various manufacturers and vendors, one of which being American Needle, Inc., a headwear manufacturer from Buffalo Grove, Illinois in the northern suburbs of Chicago, who had held one of such headwear licenses for over 20 years by the time the NFL teams decided to make a change.[127] In the late 1990s, revenues from sales of sports-related merchandise began to decline significantly and some within the licensing industry began to feel that the volume of licenses and proliferation of manufacturers contributed to a saturated market for these items.[128] Over time, this became the prevailing view among the NFL teams as well, who in December 2000, voted to authorize NFLP to grant exclusive licenses, which NFLP, following a bidding process, did with Reebok International Ltd. ("Reebok") in 2001, granting Reebok a 10-year exclusive license to manufacture and sell trademarked headwear for all 32 NFL teams.[129] Thereafter, American Needle, Inc.'s license was not renewed following the expiration of its term, the same fate befalling the other headwear vendors as well.[130]

American Needle, Inc. then filed a federal antitrust suit against the NFL, its member teams, and Reebok in the Northern District of Illinois, alleging in relevant part that the exclusive headwear license agreement between NFLP and Reebok

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[125] American Needle, Inc. v. National Football League, No. 08-661, slip. op. at 2 (U.S. May 24, 2010).

[126] American Needle, Inc. v. National Football League, 538F.3d 736, 737 (7th Cir. 2008).

[127] *Id*. at 738.

[128] Brief for the Petitioner at 6, American Needle, Inc. v. National Football League, No. 08-661 (U.S. May 24, 2010).

[129] 538F.3d at 738; *see also* No. 08-661, slip op. at 2 (U.S. May 24, 2010).

[130] 538F.3d at 738.

violated Sections 1 and 2 of the Sherman Act.[131] Specifically, American Needle, Inc. claimed that because each NFL team separately owned their respective intellectual property, their collective agreement to allow NFLP to exclusively license it was a contract, combination, or conspiracy in restraint of other vendors' ability to obtain licenses for teams' intellectual property in violation of Section 1.[132] Moreover, American Needle, Inc. alleged that in authorizing NFLP to award the exclusive license to Reebok, the member teams monopolized the markets for NFL team licensing and product wholesale in violation of Section 2.[133] The NFL, in its defense, argued that, while separate as a formal matter, the NFL, its teams, and the NFLP are incapable of violating Section 1 of the Sherman Act as they are a single economic entity, at least with regard to the licensing of their intellectual property.[134]

The trial court found in favor of the NFL without need for a trial, concluding remarkably that, with respect to the licensing of member teams' intellectual property and the promotion of the NFL generally, the NFL, its teams, and the NFLP "have so integrated their operations that they should be deemed a single entity rather than joint ventures cooperating for a common purpose."[135] Said differently, the trial court found that, at least with respect to this sphere of its operations, the NFL and its teams should be regarded as if they are a singular corporate consciousness, unable by definition to violate Section 1 of the Sherman Act under the *Copperweld* doctrine discussed in Sect. 16.4 above, the same way that internal coordination between a company's CEO and CFO or between a parent company and its wholly owned subsidiary is treated under the antitrust laws. Effectively, this would make the NFL and its teams immune to scrutiny under Section 1, at least with respect to arrangements regarding the licensing of their intellectual property. Moreover, the court found that, as a single entity, the NFL and its teams could decide to license its intellectual property "to one or many without running afoul of the antitrust laws" and therefore American Needle, Inc.'s Section 2 claim was defeated as well.

On appeal, the Court of Appeals for the Seventh Circuit, a court which had previously shown itself to be receptive to the idea of a sports league as a single entity,[136] affirmed the decision of the trial court, finding that because NFL teams can only function as "one source of economic power" in the production of NFL football (that is, they cannot do it alone), it thereby follows that they are only one source of economic power in controlling the promotion of NFL football.[137] As the *Copperweld*

[131] *Id.*

[132] *Id.*

[133] *Id.*

[134] Brief for the Respondent at 1-2, American Needle, Inc. v. National Football League, No. 08-661 (U.S. May 24, 2010).

[135] American Needle, Inc. v. New Orleans La. Saints, 496F. Supp. 2d 941, 943 (2007).

[136] *See* Chi. Professional Sports Ltd. v. National Basketball Association, 95F.3d 593, 598 (7th Cir. 1996) (noting other circuit courts which have found single entity status for sports leagues in certain circumstances and stating that, "when acting in the broadcast market, the [National Basketball Association] is closer to a single firm than a group of independent firms.").

[137] 538F.3d at 743.

doctrine stands for the proposition that the antitrust laws are most concerned with concerted action which "deprives the marketplace of independent centers of decisionmaking that competition assumes and demands,"[138] the Seventh Circuit was saying that the actions in question here were really undertaken by a *single* center of decision-making in an effort to promote the NFL in its competition with other forms of entertainment for consumers' entertainment dollars.[139] Thus, in the eyes of the court, the actions of the NFL teams in licensing collectively through NFLP were not of the character that the antitrust laws were designed to curtail under Sect. 16.1. Though not dispositive, the court also noted that "most importantly, the record amply establishes that since 1963, the NFL teams have acted as one source of economic power … to license their intellectual property collectively and to promote NFL football."[140] That is, they have been doing this a long time without competing with one another (though some may find such evidence cuts *against* the court's analysis and ultimate conclusion).

Notwithstanding the fact that the NFL had won its case in the trial court and again on appeal, the NFL called upon the United States Supreme Court to weigh-in on the matter, not just on the narrow issue at hand (the NFL's single entity status with respect to the licensing of its teams' intellectual property) but on the issue of the NFL's status as a single entity *generally* for purposes of our antitrust laws. With apologies to Shakespeare, the NFL "doth protest too much, methinks"[141] and the Supreme Court, in a rare unanimous antitrust opinion (drafted by one of the giants of antitrust jurisprudence, now-retired Justice John Paul Stevens), reversed the Seventh Circuit's decision and found that the NFL teams were substantively separate entities and their concerted action (in whatever sphere of operation), while it may ultimately be justifiable under a Rule of Reason analysis, are nevertheless subject to scrutiny under Section 1 of the Sherman Act.[142]

In reaching this conclusion, the Court noted that the analysis of these relationships always focused on the substance over form.[143] That is, whether or not the actors are legally distinct entities is not dispositive of the analysis, but we should instead set ourselves to "a functional consideration of how the parties involved in the alleged anticompetitive conduct actually operate."[144] In a prescient and apropos use of the Court's language, it has previously stated that "we are moved by the identity of the persons who act, rather than the label of their hats."[145] Indeed, the Court

[138] 467 U.S. at 768–769.

[139] 538F.3d at 743–744.

[140] *Id*. at 744.

[141] William Shakespeare, *Hamlet*, Act III, Scene II (The original quote is "[t]he lady doth protest too much, methinks" and has evolved to generally mean that one can insist so passionately about something being true that others suspect the opposite).

[142] No. 08-661, slip op. at 1 (U.S. May 24, 2010).

[143] *Id*. at 6.

[144] *Id*.

[145] United States v. Sealy, Inc., 388 U.S. 350, 353 (1967).

has previously found members of a legally single entity to have violated Section 1 of the Sherman Act with their collective action[146] and conversely stated that "there is not necessarily concerted action simply because more than one distinct legal entity is involved."[147] The relevant issue, according to the Court, is not "whether the parties involved 'seem' like one firm or a multitude of firms in any metaphysical sense" but "whether there is a 'contract, combination …, or conspiracy' amongst '*separate economic actors pursuing separate economic interests*' such that the agreement 'deprives the marketplace of independent centers of decisionmaking' and, therefore, of 'diversity of entrepreneurial interests' and thus of actual or potential competition."[148]

In this case, Court found that the NFL teams "do not possess either the unitary decisionmaking quality or the single aggregation of economic power" which are the hallmarks of actions by a single entity.[149] Rather, each team is a powerful economic entity unto itself, independently owned and independently managed with interests that, while admittedly overlapping (as they are with all cartels), are not necessarily *common*.[150] By way of example, the Court noted that, to a firm that makes hats, each of the teams in the NFL "are potentially competing suppliers of valuable trademarks."[151] Looked at differently, were the NFL's arrangement here be deemed to be immune to antitrust scrutiny, then any cartel "could evade antitrust law simply by creating a joint venture to serve as the exclusive seller of their competing product," a result which the Court would not countenance.[152] Finally, the Court eviscerated the Seventh Circuit's argument that, since this arrangement had been going on since 1963 without competition between the teams, it was evidence of single entity action, finding that "[a]n ongoing [Section 1] violation cannot evade [Section 1] scrutiny simply by giving the ongoing violation a name and label," and the "absence of actual competition may simply be a manifestation of the anticompetitive agreement itself."[153] While not in the legally binding portion of the Court's holding that concerted action by NFL teams is subject to Section 1 scrutiny, the Court offered some additional thoughts on whether it might find the restraint here an unreasonable one if it were to take up a Rule of Reason analysis thereof, noting that "it simply is not apparent that the alleged conduct was necessary at all" to the production of professional football,

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[146] *See generally*, United States v. Sealy, Inc., 388 U.S. 350 (concerning a group of mattress manufacturers controlled by Sealy, Inc. who dictated that each of the manufacturers operate only within a specific geographic area).

[147] No. 08-661, slip op. at 7 (U.S. May 24, 2010).

[148] *Id*. at 10 (quoting *Copperweld*, 467 U.S. at 769 and Fraser v. Major League Soccer, L.L.C., 284F.3d 47, 57 (1st Cir. 2002)) (emphasis added).

[149] *Id*. at 11-12.

[150] *Id*. at 12.

[151] *Id*.

[152] *Id*. at 17 (quoting Major League Baseball Properties, Inc. v. Salvino, Inc., 542F.3d 290, 335 (2d. Cir. 2008) (Sotomayor, J., concurring)).

[153] *Id*. at 13-14.

but rather, while "two teams are needed to play a football game, not all aspects of elaborate interleague cooperation are necessary to produce a game" and, even if some such agreements *are* necessary, "it does not follow that concerted activity in marketing intellectual property is necessary to produce football."[154]

The economic implications of *American Needle* are vast indeed, though it can be somewhat difficult to describe what has *not* happened as a result of a particular decision, as we are called upon to do here where the Supreme Court affirmed that the NFL is *not* a single entity for antitrust purposes. In such a situation, it may be most helpful to consider a contrahypothetical, where single entity status *was* conferred upon the NFL. In a real manifestation of the effects, in the period following the grant of an exclusive license to Reebok, Reebok executives viewed the elimination of competition as "a godsend" for profitability, noting that "[b]asic fitted caps that were selling for $19.99 a few years ago because of the price pressures are now selling for $30."[155] The NFL would avoid scrutiny for not just its collective decision to license intellectual property exclusively to Reebok, however, but rather for any concerted action previously subject to Section 1 of the Sherman Act.

Essentially, the economic outcomes in such a world are as we would expect where a group of sellers (or, in this reality, a group which constitutes a single entity monopoly with respect to professional football in the United States): we would expect output in all of its various iterations to decrease on the margin (whether that means fewer games, fewer games that we are able to view for free over broadcast channels as opposed to the NFL Network or cable, fewer "exclusive" providers of NFL-related items at higher prices and so forth), prices for output to certainly increase as any spheres of competition between the teams devolve into judicially sanctioned collusion, and, on the whole, a transfer of wealth and utility from NFL fans to the league and its teams. Depending on the breadth of the grant of single entity status, we might also see the ability of the NFL and its teams to hinder or destroy the free agency system and work collectively to suppress the wages of players, coaches, and other service providers.

Michael A. McCann, Associate Professor at the Vermont Law School, legal analyst and columnist for SI.com, recently summarized some of the implications of conferring such single entity status on sports leagues like the NFL.[156] In Professor McCann's estimation, an NFL with single entity status may lead to migration of more NFL games and programming to the NFL Network,[157] a medium which is comparatively more expensive for viewers and whose revenues are more directly harvested by the NFL. As we discussed previously, since the Sports Broadcasting Act is limited in that it only applies to "sponsored broadcasting," leaving the collective bundling of broadcast rights unprotected with respect to other media (e.g., cable,

[154] *Id*. at 15 n.7.

[155] Brief for the Petitioner at 6, No. 08-661 (U.S. May 24, 2010).

[156] *See* McCann MA, *American Needle V. NFL* (2010) An opportunity to reshape sports law. Yale Law J 119:726, 763–765.

[157] *Id*. at 763.

internet, pay-per-view), single entity status for the NFL would effectively expand the exemption to all media delivery channels, conveying significant control and opportunities for monopoly profits on the NFL. The NFL could in turn limit game broadcasts to the NFL Network channels and charge significant sums for access, neither of which actions would appear to be susceptible to a Section 2 claim under the Seventh Circuit's analysis in *American Needle*,[158] which analysis describes what reality would closely resemble in this hypothetical.

Moreover, exclusive relationships could be extended into areas which are now competitive or perpetuated past the point of social beneficence in areas where they already exist. Professor McCann gives the example of the NFL's relationship with videogame producer Electronic Arts ("EA"), maker of the popular *Madden* franchise. EA paid a reported $400 million for the exclusive rights to use NFL intellectual property in their game for a period of 5 years (the license was extended later to 2012).[159] This license eliminates much of the competition for EA, which previously had received competition from Sega, the results of which have been relatively predictable: prices for the games have increased significantly in recent years and the quality of the games themselves have come under fire by gamers and commentators.[160] While in the real world (and the world following *American Needle*), this exclusive arrangement could eventually come under fire under Section 1 of the Sherman Act, a grant of single entity status would effectively preclude such possibility had *American Needle* come out differently.

Finally, Professor McCann notes that the grant of single entity status on the NFL would have some interesting implications for the upcoming collective bargaining negotiations between the NFL and the NFL Players Association (the "NFLPA") with the current collective bargaining agreement's expiration at the end of 2010.[161] A broad grant of single entity status on the NFL as demanded by the league, whether or not it was determined to be one for purposes of labor issues (Professor McCann suggests, quite rightly, that it is unlikely it would be), could nevertheless significantly "alter the economic values of rights subject to collective bargaining."[162] While such status may convey some additional protection for the NFL's concerted actions with respect to labor, it may not be the panacea for the NFL in its negotiations with the NFLPA. Rather, as Professor McCann notes, the NFLPA may point to the NFL's single entity status as a reason to resist many of the concessions that the NFL seems

[158] *See* 538F.3d at 744 (holding that a single entity is free to license its intellectual property on an exclusive basis and suggesting that a unilateral decision by such entity to reduce output would not give rise to a colorable antitrust claim under Section 2 of the Sherman Act).

[159] McCann, *supra* note 124 at 765.

[160] *Id*. (noting that EA dropped the price of *Madden 2005* to $29.95 in response to competition from *ESPN NFL 2 k5* which sold for an initial price of $19.95 and then, in the absence of competition the next year following the exclusive deal, EA raised the price of *Madden 2006* by 70%).

[161] *Id*. at 766.

[162] *Id*.

set to request.[163] Specifically, the grant of single entity status which effectively protects the NFL and its teams in many endeavors which would otherwise be subject to Section 1 scrutiny could be pointed to by the NFLPA "as supplying owners with a revenue windfall, a significant portion of which owners need not share with players."[164] The NFLPA might then be in a stronger position to argue that, to the extent anyone needs to bear the pain on a particular issue, the owners are in a better position to do so.

16.7 Summary

This chapter has covered a fair amount of ground, so it may be useful at the conclusion to take stock of where we have been, where we are, and where to go from here. Near the outset, we set an ambitious agenda: (1) to assess the nature of the interaction between NFL teams and their individual and collective goals, (2) to examine the current landscape of US antitrust and competition laws and policies, especially as they relate to professional sports, (3) to consider the interplay between the various iterations of the NFL's operations and such framework of competition laws and policy as we grapple with how much cooperation is permissible (and even *necessary*) and how much is violative of our notions regarding business competitors, and (4) to evaluate the economic outcomes and implications from our legal system's attempts to address issues which arise in this struggle.

We began with a discussion of the various maximization functions used by economists and the question regarding the ultimate goal of an NFL team (profit or wins) to help provide the groundwork for our evaluation of teams' cooperation.[165] This argument is a long-running one among economists, and will certainly continue to rage notwithstanding anything herein, though as we saw NFL team revenues appear to behave independently of team choices regarding quality, suggesting a profit-maximizing bent to ownership decisions. That said, teams do not appear to obey purely profit-maximizing motives either, investing and spending money on talent and other inputs past the point at which microeconomic analyses of profitability would suggest they stop, which muddies the water. Though certainly not determinative, the analysis here would suggest that, on the spectrum of alternative explanations, profit and its pursuit should be considered primary.

Understanding that NFL teams seem to be at least largely, if not primarily, motivated by profit, the next piece of the puzzle was an analysis of the NFL's industrial structure and the nature of the relationships between the teams.[166] As we saw, despite

[163] *Id*. at 767.

[164] *Id*.

[165] See *infra* notes 4–17 and accompanying text.

[166] See *infra* notes 18–27 and accompanying text.

organizing into a league, NFL teams compete vigorously in a host of ways, for inputs like player talent, coaching and front office acumen, stadium venues, media coverage, sponsorships, and so on, suggesting the NFL is more representative of a cartel than a single source of economic power. On the other hand, we also saw that the outputs produced by the NFL are largely the result of necessarily *collective* effort. In certain activities and within certain markets, the NFL can be argued to be a single entity, though on the whole it is more properly defined as a cartel of ultimately self-interested constituent members, as we discussed the NFL juxtaposed with the structure and operations of Major League Soccer as a foil.

We next considered the legal and regulatory framework which lays out the broad strokes of permitted and proscribed conduct, with special focus on the Sherman Antitrust Act.[167] Section 1 of the Sherman Act generally prohibits contracts, combinations, and conspiracies in restraint of trade, while Section 2 of the Sherman Act reaches unlawful monopolization, attempts to unlawfully monopolize a market, and conspiracies to do the same. As we discussed, however, the simplicity of the statutory language tells only part of the story, with subsequent judicial decisions providing much of the texture of our jurisprudence. Indeed, the formative caselaw we studied brought us in relatively short order from a world in which our antitrust laws did not even apply to one in which leagues and its various stakeholders engaged in highly technical and nuanced arguments about the appropriate definitions of markets, the possession of market power, and the implementation of economic theory to assist in balancing the competitive benefit and harm of certain collective action.[168]

Finally, we spent a considerable amount of time discussing the background, decisions, and implications of certain seminal events and cases in the life of the NFL and modern professional football.[169] From the analysis of the *Sports Broadcasting Act* and the AFL-NFL Merger, we saw firsthand the results of conferring a statutory blessing of reduced competition and the resultant shift of utility from fans and society to teams and the league. The *USFL* and *Oakland Raiders* cases helped define some of the limits on the NFL's ability to control the input and output markets, though we saw that such limits remain quite generous to the NFL and the increased competition therefrom is often only theoretical in nature. The *American Needle* case helped clarify an aspect of antitrust jurisprudence that had been percolating for decades: the professional sports league as a single entity incapable of violating Section 1 of the Sherman Act. Though good arguments can certainly be made for the treatment of the NFL as a single source of economic power in certain aspects and in certain defined markets, the US Supreme Court refused to confer a blanket exemption from Section 1 to the NFL, instead preserving the requirement of NFL teams to justify their collective action when challenged.

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[167] See *infra* notes 28–44 and accompanying text.

[168] See *infra* notes 45–64 and accompanying text.

[169] See *infra* notes 65–163 and accompanying text.

The goal of this chapter was to help provide an overview of where we have been and where we are today with respect to these important issues, but there is plenty of fertile ground for future research, from quantitative analyses of team ownership decisions vis-à-vis profit- or win-maximizing models to qualitative analyses of the implications of the exploding new media space. From further debates on the appropriate scope of the antitrust labor exemption in professional football to the proliferation of "sabermetric" analysis in the way we think about football at all levels, never has the NFL been more economically and culturally relevant—it is time for its relevance in scholarship to begin to keep pace.

Chapter 17
Directions for Future NFL Research and the New CBA

Kevin G. Quinn

The sixteen preceding chapters outline the state of the art of the economics of the NFL, which remains a relatively young field. There remain substantial opportunities for scholars to add to the literature. One of the purposes of this concluding chapter is to offer some suggestions as to where future work might yield valuable insights.

This chapter also lists some details of the 10-year collective bargaining agreement between the NFL and its union, the NFLPA, in late July, 2011. This accord, which is the first major restructuring of the league's economic model since the landmark 1993 agreement, was struck after the preceding chapters were written, and shortly before this volume's manuscript went to the publisher. While time will reveal the ramifications of the new CBA, it is appropriate to provide readers with an outline of its major economic elements.

17.1 Directions for Future Research

About 6 years have passed since Fizel and Schatz offered their observations regarding the state of the art in football economic research. There has been substantial progress on many of the issues that they identified, but despite these good efforts, the academic literature remains more mesh than Swiss cheese. Areas of further exploration that are likely to bear the sweetest fruit fall into a few categories: the inherent complementarity of the sport, creation of economically useful productivity measures, salary modeling, issues surrounding consumer demand estimation, and consequences of relatively small n compared to baseball and basketball.

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17.1.1 Complementarity

There are very good reasons, both theoretical and empirical, why the economics of the most popular North American sport has been relatively lightly studied, especially compared to MLB. As noted by Fizel (2006) and others, American football is inherently a game of complementarity in production. This characteristic is not unique to football, of course; it is elemental to every team sport. For example, the number of runs scored by a baseball player depends not only on his own multidimensional skills but also on the skills of those batting behind him. Basketball teams also require players with different and complementary endowments—no NBA team made up exclusively of rebounders or 3-point shooters will win many games.

Despite a few attempts (e.g., Freeze 1974; Idson and Kahane 2000; Bradbury and Drien 2008; Alamar and Weinstein-Gould 2008), labor complementarity in North American sports has remained difficult to capture theoretically (Borland 2006; Berri and Simmons 2009). In baseball, basketball, and even hockey, ignoring complementarities fortunately is not fatal to generating substantial labor economics results but, with the possible exception of placekickers, this is not generally the case in football. Consequently, the appropriate treatment of complementarity is perhaps the most pressing theoretical issue for scholars of NFL football, and the area in which progress would have the most substantial impact.

17.1.2 Productivity Measures

Cheek-by-jowl with the development of theoretical machinery to handle labor complementarity is the creation of new statistical measures that can be used to empirically test it. As indicated in the quote from Schwarz (2005), this work for football lags similar efforts in baseball, which traces its statistical revolution from Henry Chadwick in the middle nineteenth century to Bill James and the birth of sabermetrics in the 1970s, through *Moneyball* implementation in the early 2000s (Schwarz 2005; Lewis 2003). Parallel to baseball's experience, development of new football statistics currently relies heavily on amateurs and dilettantes instead of on those holding academic positions. This work primarily is reported in blogs (reminiscent of James' self-published *Baseball Abstract*) such as Football Outsiders (footballoutsiders.com), Cold Hard Football Facts (*coldhardfootballfacts.com*), and any variety of sites purporting to give gamblers an edge with their weekly football wagering (e.g., *Two Minute Warning, twominutewarning.com*), rather than in peer-reviewed journals (Berri and Bradbury 2010).

Sports economists have begun to join the statistical fray (e.g., Berri et al. 2007; Bradbury 2008; Berri and Schmidt 2010), but more work needs to be done, especially for NFL football. Academicians can learn from the bloggers—some do quite sophisticated work (e.g., Brian Burke on Advanced NFL Stats)—but with a couple of caveats. First, as pointed out by Berri and Bradbury, bloggers' work generally is not subjected to rigorous prepublication examination by those with formal training in advanced analytical techniques. Violations, sometimes egregious, of the fundamental assumptions underpinning the methodologies used are sometimes glossed over. Some of this work is simple data mining of the first water. Second, and more related to the objectives of this essay, is that sports economists should focus their efforts primarily on analyses that relate to economic variables. The creation of new and interesting statistics for their own sake is not economics, and sports economists are better employed in pursuit of better understanding the economic flows and stocks associated with the sport; i.e., the prices and quantities that have economic meaning.

A visit to Baseball Reference (baseballreference.com) or Baseball Prospectus (baseballprospectus.com) brings the reader into a zoological park of exotic productivity measures, and new ones with supposed predictive value of something are being created every week. In some ways, sabermetrics is beginning to resemble high energy physics—an embarrassing number of subatomic particles that have been cataloged and described, but without a grand unifying theory that binds them all together.[1] Stigler's (1984) claim that economics is an "imperial science" that seeks to colonize other disciplines might be appropriate here, but the tools of analytical economic thought can provide a lucidity that might otherwise be absent.[2] Clarity of mission would serve well the study and invention of new labor productivity statistical measures in football by sports economists.

Technology, especially advanced video analysis, may provide an avenue that could create data sets of particular value to sports economists investigating complementarities in football production. For example, the 2010 baseball season debuted with the FieldFX object-recognition tracking technology meant to improve the quality of defensive statistics installed in MLB ballbarks (Carey 2010). The technology joins PitchFX which has been in use since the 2006 MLB playoffs (DiMeo 2007). While efforts to apply this to football are in their infancy, this technology soon may be able summarize the individual actions of each player on each play across several dimensions. Within a decade, this information could find itself presented in forms digestible by the tools employed by academic sports economists.

17.1.3 Salary Models

There are three understudied areas with respect to NFL salaries and payrolls. The first is related to the above-described difficulties in assigning individual input factors credit for team productivity results. Greater insight into these relationships could be used to find arbitrage opportunities in player labor markets, *a la Moneyball*'s

[1] There are several theories that attempt such unification, but consensus about them remains elusive (see Mohapatra, 2002).

[2] Stigler's statement is "(E)conomics is an imperial science: it has been aggressive in addressing central problems in a considerable number of neighboring social disciplines and without any invitations."

depiction of Sandy Alderson's and Billy Beane's exploitation of on-base percentage to stretch a small Oakland A's payroll (Lewis 2003; Hakes and Sauer 2006). Furthermore, a better understanding of complementarity in production could suggest specific player characteristics that could be considered general human capital (i.e., basic skills), and point to which specific human capital investments (i.e., coaching and training regimens) would yield greater output (i.e., more points scored and fewer points against).

Second is the question of how a fixed salary cap is best allocated across a team's roster. There has been some work in this area already (e.g., Quinn et al. 2007; Borghesi 2008; Maxcy 2009), but results so far remain rather inconclusive, and not yet fully integrated with the large human resources literature on this subject.

The third is a reconsideration of the marginal revenue product model of athlete pay with respect to NFL players. The MRP model has a long pedigree in sports economics. It is inherent in Rottenberg's (1956) seminal paper, and explicitly employed in Scully's (1974) work. However, it may be that other models better describe the actual process of salary setting in the NFL. For example, there is evidence that player contract negotiations can be described as rent-sharing exercises (Kowalewski 2010). Similarly, the relatively thin markets at each position for top-tier free agents and the compensation of wholly unproven rookie draftees might better follow tournament models than marginal revenue product allocations.

17.1.4 Demand Issues

The output market for any goods or services is defined by prices and quantities. Sports economists have long focused their interest on the in-person attendance market, both for individual contests and for entire seasons, and a great deal has been published about this subject for a variety of different sports, including NFL football (e.g., Spenner et al. 2004). NFL attendance demand is different than the other three major North American sports, however, for a couple of reasons. First, the market for individual contests is not as significant as that for season tickets in the NFL. Little work on this subject has been done for North American sports (an exception is Fort and Quirk 2010). In addition, the choice of a specific measure of price remains difficult—concessions, parking, seat licenses, travel costs, etc., denude the simple price of a game ticket to much of its explanatory value. There is a large literature addressing these issues for other sports, but much less so for NFL football.

Second, a relatively large majority of NFL contests sell out, especially in larger markets. While this issue has been addressed in other sports with TOBIT attendance models, the greatest variation in demand for any given contest might not so much be found at the gate, but in television viewership. While this has been the subject of some recent work published in economics journals (e.g., Tainsky 2010), much of interest remains either undone or unpublished. Analysis of television viewership data may illuminate the fine structure of demand for individual NFL contests that could offer sharper insights into how scheduling and competitive balance issues affect NFL consumers (e.g., Biner 2009).

In addition, the availability and analysis of more detailed and more systematic data on venue-related, merchandising, and advertising revenues related to NFL football would be highly useful for sports economists.

17.1.5 The "Small n" Problem

Baseball and basketball lend themselves rather nicely to statistical analyses because of their large number of individual events per season. Each MLB season features about 185,000 individual plate appearances—38.2 plate appearances per team per game for 30 MLB teams over 162 games per team per season. At 3.8 pitches per plate appearance, each season includes over 700,000 pitches (Quinn 2011). NBA basketball features a total of 1,230 games per season, with about 95 possessions per team per game, or a total of about 233,000 possessions and over 200,000 field goal attempts.[3] As indicated above, these statistical data are largely individually attributable to the roughly 1,200 and 175 individuals who play in any given MLB or NBA season, respectively.

By contrast, there are only a total of 512 NFL regular season annually (16 games per season for 32 teams), each with about 6,000 possessions that average about 5.5 plays each, for a total of approximately 33,000 plays per season (Quinn and von Allmen 2008). Again, the values associated with these numbers are not easily assignable to individual productivity.

In addition to a data set sized one order of magnitude lower than in baseball and basketball, football has a strategic state space that is an order of magnitude larger than in baseball (Quinn 2011) or likely to be found in basketball.[4] Consequently, Bellman equation analyses of football strategy necessarily have examined a limited number of decisions or been forced to greatly simplify the decisions studied (e.g., Carter and Machol 1971, 1978; Romer 2006; Kovash and Levitt 2009). To date, relatively little of in-game strategic consequence has been published in the peer-reviewed economics literature, with the notable exception of fourth down "kick or go" decisions. However, it may be that individual NFL teams and some consultants have made substantially more progress on this front, but have not made their findings public.

There are three areas in which in-game strategy analysis may be of interest to sports economists. The first is what it may indicate about the marginal revenue product of coaches, and to what degree in-game strategy is reflected in salary.

[3] Author calculation based on 2008–2009 season from databasebasketball.com.

[4] The author has not specifically investigated the size of the state space for Bellman equation analysis of in-game basketball strategy decision, but encourages the interested reader to do so.

The second is its value in assessing the validity of scouting in predicting player productivity. Finally, and perhaps most interesting, evaluation of in-game strategy decision-making might provide broader insights into behavioral economics. An example of the clarity that economic analysis might afford strategy decision-making can be found in investigations of the passing premium puzzle (Alamar 2006; Rockerbie 2008). However, it is not yet clear the extent to which this phenomenon actually represents a behavioral anomaly or efficient decision-making.

17.1.6 Other Issues

In addition to the main areas suggested above for further research, there is also a (by no means exhaustive!) laundry list of other issues associated with the NFL that could benefit from additional research by sports economists:

- *Clarification or supplement of the Forbes/Financial World methodology for determining team revenues, costs, and franchise values*. For lack of anything else even remotely as useful, sports economists rely inordinately heavily on this single source for critical economic data. However, the methodology used to derive these data has not been made public, and their reliability consequently cannot be properly evaluated.
- *Fantasy football*. The Fantasy Sports Trade Association claims that there are 30 million consumers of this product in the US and Canada (FSTA 2011). Complementarities in consumption and production associated with fantasy football would seem to be fertile for useful study. For example, Fantasy football players are more likely to attend NFL games and watch more NFL football on television (Nesbitt and King 2010a, b).
- *Impact of individual referees*: Much discussion has resulted from the publication of a recent paper finding evidence of racial discrimination among NBA referees (Price and Wolfers 2010), and similar work is underway for MLB Umpires (Tainsky and Winfree 2009). In addition, there have been a fairly wide variety of studies of the effects of NHL referees (e.g., see Leadley and Zigmont 2006). While the performance of referees has provided significant fodder for sports writers, it remains largely virgin territory for sports economists.
- *NFL ownership rules*: Article III, Section 3.2 of the NFL Constitution and By-Laws specifically forbids corporate ownership of NFL teams (NFL 1970, revised 2006). An area for future research might be the economic consequences of this ban.
- *The Sports Broadcast Act and economic consequences of cartel*: The NFL and other major league sports are specifically exempted from antitrust legislation by the Sports Broadcast Act of 1961 (15 *U.S.C.* §§ *1291–1295*), and have largely been afforded wide latitude in this area by federal authorities. There has been little work into the specific estimation of social welfare costs or benefits of the NFL's antitrust exemptions, both real and *de facto*.

17.2 Coda: The 2011–2021 Collective Bargaining Agreement

According to the NFLPA (2011) and Brandt (2011a, b), the major elements of the new CBA are:

- All team and league revenues, not just those shared by the teams, are the basis for player compensation.
- The salary cap will be set so that the players' share will be in a narrow band of 47–48.5% of all league revenues. This share will come from a mix of 55% of league media revenues, 45% of NFL Ventures revenue, and 40% of local team revenues (which are currently not shared by teams with each other). For the 2011 season, this represents approximately a $200 million in additional money relative to the old agreement, with that difference likely to increase in the future.
- The league-wide cash spend of the cap will be a minimum of 99% in 2011–2012, and 95% during 2013–2020, with minimum individual team cash spends of 89% 2013–2020.
- Rookie salaries will be pegged to veteran player salaries, depending where the player was picked and what position he plays.
- In the years preceding the new CBA, just less than half of all NFL players were paid league minimum salaries, which depend on years of service for each player. The new agreement calls for a $55,000 increase across the board in 2011, with annual $15,000 additional increases.
- A "legacy fund" of $620 million over the life the CBA to fund increased pension benefits for pre-1993 retirees. Forty-nine percent of that amount will be paid by the current players as part of their share of NFL revenues, and 51% will be paid separately by the owners.
- Player contracts will be guaranteed for up to year 3 in the event of injury. All players who play in an NFL game during the life of the new CBA will be qualified to remain in the NFL medical plan for life, as opposed to only 5 years under the prior agreement.
- Changes in work rules that will result in less full-contact practice time.
- The season remains at 16 regular season and 4 preseason games, through 2013, with the NFLPA having veto power over any changes thereafter.
- The league and the union agreed to having disputes over revenues, salary caps, and free agency overseen by a mutually agreed-upon arbitrator. This likely means that these issues will no longer be overseen by Judge Doty of the federal district court in Minnesota.

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